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**TEST REPORT**

**China Harbour Engineering Co. Ltd.**

**IMPROVEMENT WORKS  
TO TUNG PING CHAU PUBLIC PIER**

**(CONTRACT NO.: CV/2004/04)**

**MONTHLY EM&A MONITORING REPORT**

**(AUGUST 2006)**

Prepared by:



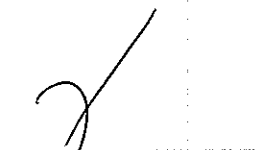
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Report No.: ENA60625



## INDEPENDENT ENVIRONMENTAL CHECKER

### CHECK CERTIFICATE

Signed : \_\_\_\_\_  
Independent Checker (Environmental)

Name : Dr. Roger W K Sze  
Roger Sze & Associates Ltd.

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PW-TPC-006 Improvement Works to Tung Ping Chau Public Pier – Environmental Monitoring

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## **EXECUTIVE SUMMARY**

This monthly EM&A report (No.10) has been prepared by the Environmental Team (ET) of ETS-Testconsult Ltd for impact monitoring under "the Contract No. CV/2004/04 Improvement Works to Tung Ping Chau Public Pier (The Project)" during the reporting period from 01 to 31 August 2006.

Under the requirements of Environmental Monitoring and Audit Programme of the Contract No. CV/2004/04 "Improvement Works to Tung Ping Chau Public Pier", EM&A requirement as set out in the PS is required to be implemented. In accordance with the PS, impact environmental monitoring of water quality and site audit is required for the Project.

### **Construction Progress**

The major construction works in this reporting month were coring the holes for bar anchor at Caisson A & B and fixing and grouting the T50 Anchor bar at Caisson A & B.

### **Environmental Monitoring Progress**

The summary of the monitoring activities in this monitoring month is listed below:

- *Marine Water Quality Monitoring: 11 Occasions at 4 designated locations;*
- *Site Inspection: 4 Occasions.*

### **Marine Water Quality Monitoring**

Marine water quality monitoring on 02 and 04 August 2006 were cancelled due to the bad weather (Typhoon Signal No.1 and 3).

According to the monitoring results, no exceedances of Action and Limit Levels were recorded for water quality monitoring parameters in this reporting month.

### **Environmental Complaints**

No complaints were received in this reporting month

### **Notification of summons and successful prosecutions**

There were no notification of summons and prosecutions with respect to environmental issues in this month.

### **Future Key Issues**

Base on the site inspections and forecast of engineering works in the coming month, key issues to be considered are as follows:

- *Maintain good site practice to avoid the environmental impact to the environment;*
- *Maintain good waste management to minimize environmental impacts at the site;*
- *Follow-up improvements on environmental and waste management issues.*

## 1. INTRODUCTION

China Harbour Engineering Co. Ltd. (CHEC) was awarded the contract, Improvement Works to Tung Ping Chau Public Pier (Contact No.: CV/2004/04). Baseline monitoring and impact monitoring will be carried out at Tung Ping Chau Public Pier by Environmental Team (ET) of ETS-Testconsult Ltd (ETL). Roger Sze & Associates Ltd. was appointed by CHEC as Independent Checker (Environmental).

The purpose of this Impact report is to monitor marine water quality during the construction works at the Project in August 2006 in order to control or avoid the environmental impacts to the environment nearby.

## 2. PROJECT INFORMATION

### 2.1 Background

The project will be planned and designed in-house by Port Works Division, Civil Engineering and Development Department. It is expected that the construction will be executed by China Harbour Engineering Co. Ltd to be appointed through tendering exercise.

### 2.2 Site Description

Figure PW-TPC-006 shows the monitoring locations of the site at Tung Ping Chau Public Pier.

### 2.3 Construction Programme

The project comprises the reconstruction of the Tung Ping Chau Public Pier and the proposed scope includes:

- Setting up of a temporary site office;
- Demolition of the existing catwalk;
- Construction of a new catwalk of about 33m long and 5.5m wide with two supporting column;
- Widening of the existing rubble causeway from 3m to 5.5m; and
- Construction of a new roof.

Details of construction programme are shown in Appendix G.

### 2.4 Project Organization

The organization chart with respect to the on-site environmental management and monitoring program are shown in Appendix A.

### 2.5 Contact Details of Key Personnel

The key personnel contact names and telephone numbers, and construction programme are shown in table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel. No.	Fax No.
CEDD	Employer	Mr. David C S Leung	2762 5546	2714 2054
Roger Sze & Associates Ltd.	Independent Checker (Environmental)	Ir. Dr. Roger W K Sze	2687 5681	2687 5826
CHEC	Main Contractor	Mr. Daniel Cheung	6012 2279	2952 9068
ETL	Contractor's Environmental Team	Mr C L Lau	2946 7792	2695 3944

### 3. CONSTRUCTION PROGRESS IN THIS REPORTING MONTH

A summary of the major construction activities undertaken in this reporting month is shown in Table 3.1.

Table 3.1 Major Construction Activities in this reporting month

Item	Construction Activities
1	Coring the holes for bar anchor at Caisson A & B
2	Fixing and grouting the T50 Anchor bar at Caisson A & B

### 4. IMPACT MARINE WATER QUALITY MONITORING

#### 4.1 Monitoring Locations

The Impact water quality monitoring and control locations are shown in Table 4.1.

Table 4.1 Impact Water Quality Monitoring Stations

Station	EASTING (m)	NORTHING (m)
C1	862 465.831	845 178.516
C2	862 771.171	845 012.179
M1	862 628.165	845 052.670
M2	862 663.052	845 031.017

During the impact monitoring, C2 was the upstream control station for all monitoring stations at mid-flood and C1 was the upstream control station for all monitoring stations at mid-ebb.

#### 4.2 Monitoring Parameters

Monitoring of the marine water quality parameters listed in Table 4.2 shall be carried out by the ES to ensure that any deteriorating water quality could be readily detected and timely action be taken to rectify the situation.

Table 4.2 Water Quality Monitoring Parameters

In-situ measurement	Laboratory analysis
Dissolved Oxygen (mg/L)	Suspended solids (mg/L) (Depth-average)
Dissolved Oxygen (%)	
Temperature (°C)	
Turbidity (NTU) (Depth-averaged)	
Salinity (ppt)	

#### 4.3 Monitoring Frequency

The frequency of the Impact water quality monitoring is summarized in Table 4.3.

Table 4.3 Monitoring frequency of Impact Monitoring

Parameter	Frequency	Monitoring Depth
Temperature	2 tides/day (Mid-flood and Mid-ebb): ■ 3days/week during the pilling and demolition works. ■ 1day/week during the marine works (not involving pilling and demolition works).	Surface, middle and bottom
Salinity		
Dissolved Oxygen		
Dissolved Oxygen saturation		
Turbidity		
Suspended solids		

#### 4.4 Monitoring Methodology and Equipment Used

##### **Positioning of the monitoring stations**

A hand-held digital Global Positioning System (GPS) was used to identify the designated monitoring stations prior to water sampling.

##### **Water Depth measurement**

A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring station.

##### **Dissolved Oxygen and temperature measuring equipment**

The instrument should be a portable, weatherproof dissolved oxygen-measuring instrument complete with cable, sensor, comprehensive operation manuals, and use a DC power source. It should be capable for measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200 % saturation; and
- a temperature of 0-45 degree Celsius

It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary (e.g. YSI model 95 meter or equivalent.)

Shall salinity compensation not be built-in in the dissolved oxygen equipment, in-situ salinity shall be measured to calibrate the dissolved oxygen equipment prior to each dissolved oxygen measurement.

##### **Turbidity Measurement Instrument**

The instrument should be a portable, weatherproof turbidity-measuring instrument complete with comprehensive operation manual. The equipment shall use a DC power source. It should have a photoelectric sensor capable of measuring turbidity between

0-1000 NTU and be complete with a cable (e.g. HACH model 2100P or equivalent)

##### **Salinity**

A portable salinometer capable of measuring salinity in the range 0-40 ppt shall be provided for measuring salinity of the water at each monitoring location. (e.g. YSI model 30 meter or equivalent.)

##### **Suspended Solids/Water Sampler**

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 litres, and can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (e.g. Kahlsico Water Sampler or equivalent).

#### 4.5 In-situ measurement

All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use. Wet bulb calibration for a DO meter was carried out before measurement at each monitoring location.

In-situ monitoring was carried out at three depths: 1 meter below water surface, at mid-depth and 1 meter above the seabed. If the water depth is less than 6 m, the mid-depth station shall be omitted and if the water depth is below 3 m, only the mid depth station shall be monitored.

At each measurement / sampling depth, two consecutive measurements of dissolved oxygen (DO), dissolved oxygen saturation (DOS), turbidity and salinity were taken. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement.

Table 4.4 shows the equipment used for in-situ monitoring of water quality. The calibration certificates are attached in Appendix A.



Table 4.4 Details Impact Monitoring Equipment (In-site measurement)

Parameter	Model	Date of Calibration	Due Date	Equipment No.
Coordinate of Monitoring stations	MLR GPS Navigator, SP24	-----	-----	EW/005/01*
Dissolved Oxygen (Saturation), Temperature	YSI Dissolved Oxygen Meter, YSI 95	30-05-2006 22-08-2006	29-08-2006 21-11-2006	EW/003/001
Turbidity	HACH Model 2100P Turbid Meter	28-07-2006	28-10-2006	ET/0505/002
Salinity	YSI Model 30M	28-07-2006	28-10-2006	ET/0527/001
Water Depth	EAGLE Strata 128 Sonar	-----	-----	EW/002/02*

Remark:(\*) indicates the calibration of instrument is not necessary.

#### 4.6 Water Sampling and Sample Analysis

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 litres, was lowered into the water body at the predetermined depth. The opening ends of the sampler were then closed accordingly and water samples were collected.

At each station, marine water samples were collected at three depths: 1 meter below water surface, at mid-depth and 1 meter above the seabed.

The sample container, made by high-density polythene, was rinsed with a portion of the water sample. The water sample was then transferred to the container, labelled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The water samples were then delivered to a local HOKLAS-accredited laboratory (Environmental Laboratory, ETS-Testconsult Ltd, HOKLAS Registration No. 022) on the same day for analysis.

The laboratory testing of suspended solids was started within 24 hours after collection of the water samples. The Suspended Solids determination work was followed APHA 20ed 2540D. The determination limit of suspended solids is 1mg/L. An accurate electronic balance with precision level is readable to 0.1mg. Environmental Laboratory of ETS-Testconsult Ltd has quality assurance and quality control programs in accordance with HOKLAS requirement. For the QA/QC procedures, one QC sample, one duplicate sample and one sample spike of every batch of 20 samples were analysis. The QA/QC results are summarized in Appendix E.

#### 4.7 Action and Limit Level

The water quality criteria, namely Action and Limit (A/L) levels. A/L Levels determined according to the baseline report are presented in the Table 4.5.

Table 4.5 Action and Limit Levels for Marine Water Quality

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface &amp; Middle</u> 5.67 mg/L (5%-ile of baseline data for surface and middle layer)  <u>Bottom</u> 5.59 mg/L (5%-ile of baseline data for bottom layer)	<u>Surface &amp; Middle</u> 5.57 mg/L (1%-ile of baseline data for surface and middle layer) or 4 mg/L except 5 mg/L for FCZ  <u>Bottom</u> 5.40 mg/L (1%-ile of baseline data for bottom layer) or 2 mg/L
SS (mg/L) (Depth-averaged)	5.5 mg/L (95%-ile of Impact data) and 120% of the upstream control station's SS at the same tide on the same day	6.0 mg/L (99%-ile of Impact data) and 130% of the upstream control station's SS at the same tide on the same day and specific sensitive receiver water quality requirements (e.g. required suspended solids level for concerned sea water intakes)
Turbidity (NTU) (Depth-averaged)	5.50 NTU (95%-ile of Impact data) and 120% of the upstream control station's turbidity at the same tide on the same day	6.59 NTU (99%-ile of Impact data) and 130% of the upstream control station's turbidity at the same tide on the same day

#### 4.8 Event and Action Plan

Should the monitoring results of the water quality parameters at any designated monitoring stations indicate that the water quality criteria are exceeded, the actions in accordance with the Event and Action Plan that summarized in Table 4.6 should be carried out.

Table 4.6 Event and Action Plan for Water Quality Monitoring

Event	Action by Environmental Team (ET) Leader	Action by Independent Checker (Environmental), IC(E)	Action by Engineer	Action by Contractor
Action Level being exceed for one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working method;</li> <li>5. Discuss mitigation measures with IC(E) and the Contractor;</li> <li>6. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and the Contractor on the mitigation measures;</li> <li>2. Review proposals on mitigation measures submitted by the Contractor and advise the Engineer accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E) on the proposed mitigation measures;</li> <li>2. Make agreement on the mitigation measures to be implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET, IC(E) and the Engineer and the propose mitigation measures to IC(E) and the Engineer within 3 working days;</li> <li>6. Implement the agreed mitigation measures.</li> </ol>
Action Level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working method;</li> <li>5. Discuss mitigation measures with IC(E) and the Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Prepare to increase the monitoring frequency to daily;</li> <li>8. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and the Contractor on the mitigation measures;</li> <li>2. Review proposals on mitigation measures submitted by the Contractor and advise the Engineer accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E) on the proposed mitigation measures;</li> <li>2. Make agreement on the mitigation measures to be implemented;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET, IC(E) and the Engineer and the propose mitigation measures to IC(E) and the Engineer within 3 working days;</li> <li>6. Implement the agreed mitigation measures.</li> </ol>
Limit level being exceeded by on sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working method;</li> <li>5. Discuss mitigation measures with IC(E) and the Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and the Contractor on the mitigation measures;</li> <li>2. Review proposals on mitigation measures submitted by the Contractor and advise the Engineer accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E), ET and the Contractor on the mitigation measures;</li> <li>2. Request the Contractor to critically review the working method;</li> <li>3. Make agreement on the mitigation measures to be implemented;</li> <li>4. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET, IC(E) and the Engineer and the propose mitigation measures to IC(E) and the Engineer within 3 working days;</li> <li>6. Implement the agreed mitigation measures.</li> </ol>

Event	Action by Environmental Team (ET) Leader	Action by Independent Checker (Environmental), IC(E)	Action by Engineer	Action by Contractor
Limit level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working method;</li> <li>5. Discuss mitigation measures with IC(E) and the Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit Level</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and the Contractor on the mitigation measures;</li> <li>2. Review proposals on mitigation measures submitted by the Contractor and advise the Engineer accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E), ET and the Contractor on the mitigation measures;</li> <li>2. Request the Contractor to critically review the working method;</li> <li>3. Make agreement on the mitigation measures to be implemented;</li> <li>4. Assess the effectiveness of the implemented mitigation measures;</li> <li>5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET, IC(E) and the Engineer and the propose mitigation measures to IC(E) and the Engineer within 3 working days;</li> <li>6. Implement the agreed mitigation measures;</li> <li>7. As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities.</li> </ol>

#### 4.9 Monitoring Duration and Period

Monitoring on 02 and 04 August 2006 was cancelled due to the bad weather (Typhoon Signal No.1 and 3). Table 4.7 shows the schedule for Impact water quality monitoring.

Table 4.7 Schedule for Impact Monitoring

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2 * Mid-flood (08:30-10:30) Mid-ebb (14:30-16:30)	3	4 * Mid-ebb (08:00-10:00) Mid-flood (16:00-18:00)	5
6	7 Mid-ebb (09:00-11:00) Mid-flood (17:00-19:00)	8	9 Mid-ebb (11:15-13:15) Mid-flood (16:30-18:30)	10	11 Mid-flood (07:00-09:00) Mid-ebb (13:00-15:00)	12
13	14 Mid-flood (08:45-10:45) Mid-ebb (15:00-17:00)	15	16 Mid-flood (11:00-13:00) Mid-ebb (16:15-18:15)	17	18 Mid-ebb (08:30-10:30) Mid-flood (15:30-17:30)	19
20	21 Mid-ebb (10:00-12:00) Mid-flood (16:00-18:00)	22	23 Mid-ebb (11:30-13:30) Mid-flood (16:30-18:30)	24	25 Mid-ebb (12:30-14:30) Mid-flood (17:00-19:00)	26
27	28 Mid-flood (07:45-09:45) Mid-ebb (14:00-16:00)	29	30 Mid-flood (09:15-11:15) Mid-ebb (15:00-17:00)	31		

Remark (\*): Monitoring on 02 and 04 August 2006 was cancelled due to bad weather (Typhoon Signal No.1 and 3)

#### 4.10 Impact Monitoring Results

No exceedances of Action and Limit Level of water quality monitoring parameters were recorded in this reporting month. All monitoring results are provided in Appendix B2. Graphical presentation of the monitoring results for the reporting month are shown in Appendix B3.

## 5. ENVIRONMENTAL NON-CONFORMANCE

### 5.1 Summary of water quality monitoring

No exceedances of Action and Limit Level of marine water quality monitoring parameter were recorded in this reporting month.

### 5.2 Summary of Environmental Complaints

No complaints were received during the reporting month.

### 5.3 Summary of Notification of Summons and Prosecution

There were no notification of summons respect to environmental issues registered in this month.

## 6. STATUS OF ENVIRONMENTAL LICENSING AND PERMITTING

All permits/licenses valid in this reporting month are summarized in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-222/2005	07/09/04	---	<ul style="list-style-type: none"> <li>▪ Setting up of a temporary site office;</li> <li>▪ Demolition of the existing catwalk;</li> <li>▪ Construction of a new catwalk of about 33m long and 5.5m wide with two supporting column;</li> <li>▪ Widening of the existing rubble causeway from 3m to 5.5m; and</li> <li>▪ Construction of a new roof.</li> </ul>

## 7. WASTE MANAGEMENT

The quantities of waste for disposal in this month are summarized in Table 7.1.

Table 7.1 Summary of Quantities of Waste for Disposal in this reporting month

Type of Waste	Quantity	Disposal Location	Project Cumulative Quantity
C&D Materials (Inert) (m <sup>3</sup> )	0	Stall at site	6
C&D Materials (Non-inert) (m <sup>3</sup> )	0	Nil	0
General Refuse (m <sup>3</sup> )	0	Nil	0
Chemical Waste (m <sup>3</sup> )	0	Nil	0

## 8. SITE INSPECTION

Weekly site inspection was carried out by the ET. Four site inspections were undertaken in monitoring period. Details of the site inspection findings are attached in Appendix F.

### 8.1 Summary of site inspection findings

The summary of site inspection findings are shown in Table 8.1.

Table 8.1 The summary of site inspection findings

<i>Inspection Parameter</i>	<i>Finding</i>
<i>Water Quality</i>	<i>Water quality was found satisfactory during the site inspection period. No visible foam, oil, grease, litter or other objectionable matter was present on the water within the site.</i>
<i>Air Quality</i>	<i>Air quality was found satisfactory during the site inspection period. No noticeable dust was generated at the site.</i>
<i>Noise Quality</i>	<i>Noise quality was found satisfactory during the site inspection period.</i>

## 8.2 Recommendations on site inspection findings

Based on the site inspection findings, the recommendations are as below:

- *Maintain good site practices to avoid environmental impacts to the environment;*
- *Maintain good waste management at the site;*
- *Remove the construction wastes accumulated inside and outside the construction site periodically.*

## 9. IMPLEMENTATION STATUS

### 9.1 Implementation Status of Environmental Mitigation Measures

Most of the necessary mitigation measures were implemented properly.

### 9.2 Implementation Status of Event and Action Plan

There were no exceedances of Action and Limited Level in this reporting month. Hence, no further mitigation measures were required.

### 9.3 Implementation Status of Environmental Complaint Handling

No complaints had been received during this monitoring month.

## 10. CONCLUSION

According to the marine water monitoring results, all monitoring results were found within the Action and Limit Level in this reporting month. Hence, no further mitigation measures were required.

According to the weekly site inspections carried out by the ET, it was found that air, noise and water quality were found satisfactory in this monitoring period.

Finally, ES recommended the Contractor to maintain good waste management and good site practice in order to minimize the environmental impacts at the site.

## 11. FUTURE KEY ISSUES

### 11.1 Upcoming EM&A Schedule

The Proposed EM&A program in coming month is presented as following Table 11.1.

Table 11.1 Upcoming EM&A Schedule in coming month

<i>Monitoring Location</i>	<i>September 2006</i>
<i>Marine Water Quality Monitoring</i>	<i>01, 04, 06, 08, 11, 13, 15, 18, 20, 22, 25, 27, 29</i>
<i>Site Inspection</i>	<i>06, 13, 20, 27</i>

## 11.2 Upcoming Construction Works Schedule

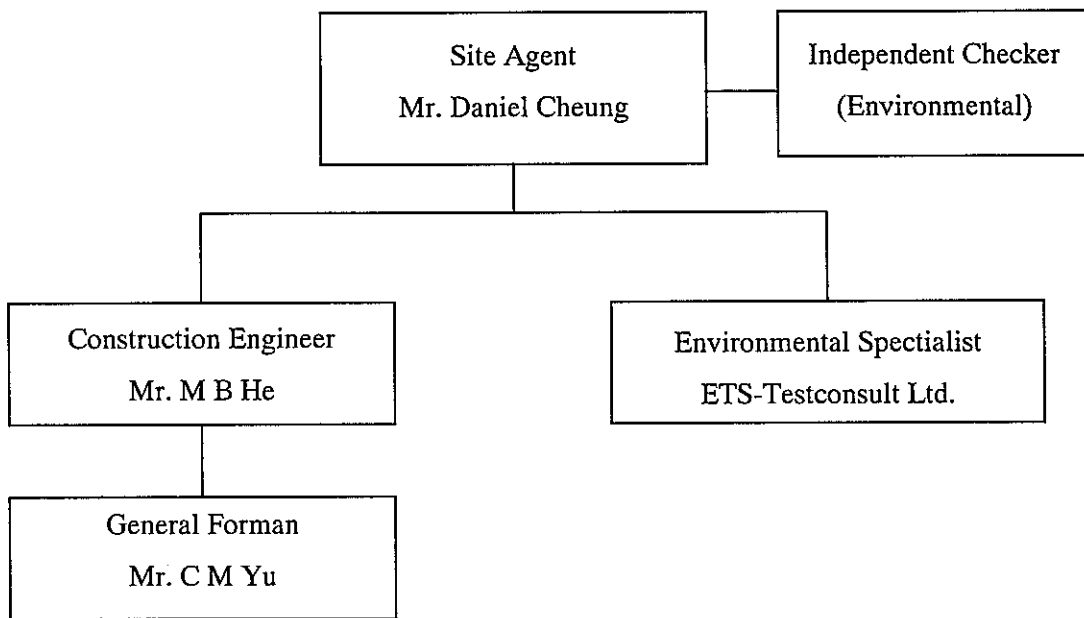
The major construction works planned to be carried out in next month is tabulated (Table 11.2):

Table 11.2 Construction Plan in the coming month

Month	Works Planned to be Carried Out (Proposed)
September 2006	<ul style="list-style-type: none"> <li>• Coring the holes for bar anchor at Caisson A &amp; B;</li> <li>• Fixing the links in two caissons;</li> <li>• Infill concrete into two caissons;</li> <li>• Cut down the top level of the caissons;</li> <li>• Breaking small part of the existing Catwalk;</li> <li>• Fixing and grouting the T50 Anchor bar at Caisson A, Causeway (Phase 1 &amp; 2) and Pile Head (Phase 1);</li> <li>• Excavating the existing slope at Causeway (Phase 1);</li> <li>• Concreting bedding of the mass at Causeway (Phase 1);</li> <li>• Coring the holes for T50 Bar at causeway (Phase 1 &amp; 2) and Pile Head (phase 1);</li> <li>• Shuttering formworks to the mass at Causeway (Phase 1) and Pile Head (Phase 1);</li> <li>• Fixing rebar to the mass at Causeway (Phase 1) and Pile Head (Phase 1);</li> <li>• Concreting the east side mass at Causeway (Phase 1); and</li> <li>• Laying the steel plates for the UB at Causeway (Phase 1).</li> </ul>

**Appendix A**  
**Organization Chart**

# Management Structure





## **Appendix B**

### **Calibration Certificates for Marine Water Quality Monitoring Equipments**



### Internal Calibration Report of Turbidimeter

Equipment Ref. No. : ET/0505/002

Manufacturer : HACH

Model No. : 2100P

Serial No. : 930900 003728

Date of Calibration : 28/7/06

Calibration Due : 28/10/06

#### Data

(4.95) 0 - 10 NTU Gelex Vial	(49.0) 10 - 100 NTU Gelex Vial	(409) 100 - 1000 NTU Gelex Vial
4.92	48.2	405

The equipment complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use.

\* Delete as appropriate

Calibrated by : [Signature]

Approved by : [Signature]



## Performance Check of Salinity Meter

Equipment Ref. No. : ET/0527/001      Manufacturer : YSI  
Model No. : Model 30      Serial No. : 9961183  
Date of Calibration : 28/7/06      Due Date : 28/10/06

Ref. No. of Salinity Standard used (30ppt)

I196A

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30	29.5	1.7%

Acceptance Criteria

Difference : <10 %

The salinity meter complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Checked by : 

Approved by : 



## Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : ET/EW/003/001      Manufacturer : YSI  
 Model No. : 95      Serial No. : 97H 04071AD  
 Date of Calibration : 30/5/16      Calibration Due Date : 29/8/16

Ref. No. of Reference Thermometer : ET/2403/01  
 Ref. No. of Potassium Dichromate : ET/0520/003/02

### Temperature Verification

	Temperature (°C)
Thermometer reading	20.0
Meter reading	20.0

### Linearity Checking

Purging time, min	DO meter reading, mg/L			Winkler Titration result, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.45	7.43	7.44	7.50	7.52	7.51	0.94
5	5.51	5.49	5.50	5.63	5.61	5.62	2.16
10	3.68	3.66	3.67	3.56	3.54	3.55	3.32
Linear regression coefficient				0.9981			

### Zero Point Checking

DO meter reading, mg/L	0.00
------------------------	------

### Salinity Checking

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.11	7.09	7.10	7.20	7.18	7.19	1.26
30	6.53	6.51	6.52	6.66	6.64	6.65	1.97

### Acceptance Criteria

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : > 0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \*  
 / ~~unacceptable~~ \* for use:

\* Delete as appropriate

Calibrated by : C. de G. Lau      Approved by : [Signature]



### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/2W/003/001</u>	Manufacturer : <u>- YSI</u>
Model No. : <u>95</u>	Serial No. : <u>97H 04071 AD</u>
Date of Calibration : <u>22/8/06</u>	Calibration Due Date : <u>21/11/06</u>

Ref. No. of Reference Thermometer : ET/2403/01

Ref. No. of Potassium Dichromate : ET/0520/003/02

#### Temperature Verification

	Temperature (°C)
Thermometer reading	20.0
Meter reading	20.0

#### Linearity Checking

Purging time, min	DO meter reading, mg/L			Winkler Titration result, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.64	7.66	7.65	7.58	7.60	7.59	0.79
5	5.54	5.56	5.55	5.46	5.44	5.45	1.82
10	3.14	3.16	3.15	3.27	3.29	3.28	4.04
Linear regression coefficient						0.9988	

#### Zero Point Checking

DO meter reading, mg/L	0.00
------------------------	------

#### Salinity Checking

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.29	7.31	7.30	7.24	7.26	7.25	0.69
30	6.99	6.97	6.98	6.89	6.87	6.88	1.44

#### Acceptance Criteria

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : > 0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use:

\* Delete as appropriate

Calibrated by : PK

Approved by : [Signature]

## **Appendix C**

### **Marine Water Monitoring Results**



## Environmental Marine Water Monitoring Data at Tung Ping Chau Public Pier

### 3. Water Temperature (°C)

Date	Temperature (°C)																	
	C1				M1				M2				C2					
	Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb			
07/08/06	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B
09/08/06	29.4	29.7	29.2	29.2	29.4	29.2	29.6	29.1	29.2	29.2	29.4	29.1	29.2	29.2	29.1	29.0	29.5	29.0
11/08/06	27.4	27.2	27.6	27.5	27.6	27.6	27.6	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	27.7
14/08/06	29.2	29.2	29.1	29.3	29.4	29.4	29.1	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.1	29.0	29.3	29.1
16/08/06	31.7	30.9	30.8	31.1	30.8	31.2	31.1	30.6	31.4	30.6	31.4	31.6	31.2	31.6	30.7	31.6	31.2	30.5
18/08/06	31.7	31.4	31.4	31.8	31.4	31.2	31.4	31.4	31.4	31.4	31.4	32.2	32.3	31.2	31.7	31.2	30.9	30.9
21/08/06	29.3	29.0	30.4	29.6	30.1	30.1	29.6	30.0	30.0	30.2	30.0	30.1	29.6	29.2	30.0	30.0	29.8	29.8
23/08/06	30.6	30.1	30.9	30.5	30.4	30.4	29.7	30.4	30.4	30.6	30.4	29.5	30.3	30.5	30.4	30.4	30.1	30.1
25/08/06	29.8	29.6	29.6	29.6	29.6	29.6	29.6	29.4	29.4	29.4	29.4	29.4	29.9	29.5	29.6	29.6	29.5	29.5
28/08/06	28.8	28.6	29.0	28.7	28.9	28.9	28.7	28.9	28.9	28.7	28.9	28.8	28.6	28.5	28.9	28.6	28.8	28.8
30/08/06	30.2	30.1	30.9	30.1	30.9	30.1	30.1	30.5	30.5	29.8	29.8	30.9	29.8	29.8	32.1	29.8	30.9	30.9

### 4. Dissolved Oxygen (DO, mg/L)

Date	Dissolved Oxygen (DO, mg/L)																	
	C1				M1				M2				C2					
	Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb			
07/08/06	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B
09/08/06	7.05	7.30	6.65	6.96	7.08	6.65	7.17	7.24	7.24	7.36	7.08	7.08	7.10	7.40	7.38	7.20	7.38	7.09
11/08/06	7.05	7.00	7.14	6.94	6.95	6.95	6.80	7.07	7.07	6.80	6.95	7.00	7.00	7.10	6.93	7.08	6.93	6.96
14/08/06	7.74	7.74	7.87	7.87	7.87	7.87	7.60	7.79	7.79	7.60	7.79	7.78	7.78	7.78	7.88	7.57	7.19	6.91
16/08/06	7.17	7.32	8.35	7.34	8.35	7.34	7.34	8.16	8.16	7.39	8.16	8.19	7.31	7.31	7.42	8.08	8.33	8.33
18/08/06	6.78	6.88	6.87	6.94	6.67	6.67	6.82	6.91	6.91	6.82	6.91	6.94	6.64	6.64	6.79	6.98	6.82	6.82
21/08/06	6.32	6.66	6.80	6.56	6.69	6.69	6.88	6.88	6.88	6.88	6.70	6.80	6.80	6.80	6.29	6.64	6.81	6.81
23/08/06	7.47	7.52	6.64	7.47	6.64	6.64	7.55	6.68	6.68	7.55	6.68	6.59	6.59	6.59	6.74	7.21	6.74	6.72
25/08/06	5.97	6.07	5.81	5.94	5.85	5.85	6.18	5.77	5.77	6.17	6.17	5.75	5.75	5.75	5.99	6.04	5.99	5.77
28/08/06	7.89	7.63	7.79	7.84	7.44	7.44	7.84	7.63	7.63	7.90	7.63	7.51	7.51	7.51	7.16	7.65	7.26	7.26
30/08/06	6.63	6.28	6.92	6.42	6.92	6.42	6.47	6.87	6.87	6.47	6.87	6.98	6.78	6.78	6.62	6.93	7.27	7.27

### 5. Dissolved Oxygen Saturation (DOS, %)

Date	Dissolved Oxygen Saturation (DOS, %)																	
	C1				M1				M2				C2					
	Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb			
07/08/06	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B
09/08/06	107.6	109.5	98.9	111.8	106.2	100.4	109.5	110.6	110.6	110.4	104.5	108.1	108.1	111.0	108.0	110.7	106.4	106.4
11/08/06	107.2	106.6	107.7	107.7	104.9	104.9	105.7	106.7	106.7	103.4	104.5	105.7	105.7	105.7	108.5	108.5	104.2	104.2
14/08/06	116.1	116.1	118.1	118.1	118.1	118.1	114.0	116.9	116.9	114.0	116.9	116.7	116.7	116.7	118.2	118.2	114.3	114.3
16/08/06	112.9	114.2	129.9	115.1	129.9	115.1	116.4	127.0	127.0	116.4	127.0	129.3	115.3	115.3	127.1	127.1	129.5	129.5
18/08/06	102.3	103.9	103.9	103.9	100.1	100.1	102.5	104.6	104.6	102.5	104.6	105.3	105.3	105.3	105.6	105.6	103.1	103.1
21/08/06	94.6	97.8	104.1	102.2	102.2	102.2	117.9	105.8	105.8	102.9	104.6	102.6	102.6	102.6	101.3	101.3	104.6	104.6
23/08/06	116.1	116.7	116.7	116.7	104.4	104.4	116.6	116.6	116.6	117.9	116.6	89.4	89.4	89.4	93.3	93.3	89.7	89.7
25/08/06	92.1	93.5	89.8	88.0	88.0	88.0	94.8	94.8	94.8	94.8	95.4	95.4	95.4	95.4	93.3	93.3	89.7	89.7
28/08/06	118.4	118.4	114.5	116.9	111.6	111.6	118.5	114.5	114.5	118.5	114.5	112.7	112.7	112.7	114.8	114.8	108.9	108.9
30/08/06	102.3	96.6	107.9	98.9	107.9	98.9	99.1	106.8	106.8	99.1	106.8	108.9	103.9	103.9	101.2	110.0	113.1	113.1



## Environmental Marine Water Monitoring Data at Tung Ping Chau Public Pier

### 6. Salinity

Date	Salinity (ppt)																							
	C1						M1						M2						C2					
	Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb	
	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave
07/08/06	-	30.2	-	-	-	30.2	-	-	30.3	-	-	30.0	-	-	30.2	-	-	30.0	-	-	30.0	-	-	30.8
09/08/06	28.1	27.7	-	27.9	-	28.2	-	28.1	-	27.9	-	28.0	-	28.0	-	27.9	-	28.1	-	28.1	-	28.3	-	27.9
11/08/06	29.6	30.5	30.7	-	30.9	-	30.6	-	30.4	-	30.4	-	30.4	-	30.6	-	30.2	-	30.2	-	30.6	-	30.9	
14/08/06	-	28.1	-	28.8	-	27.9	-	28.3	-	27.9	-	27.8	-	28.3	-	29.1	-	27.9	-	28.4	-	28.4	-	29.1
16/08/06	27.9	-	28.0	-	28.1	-	28.2	-	28.2	-	28.2	-	28.0	-	28.0	-	28.0	-	28.0	-	27.8	-	28.3	
18/08/06	27.8	-	28.1	27.9	-	28.2	-	28.1	-	28.1	-	27.5	-	28.0	-	28.0	-	27.4	-	27.8	-	27.6	-	28.0
21/08/06	29.6	-	29.9	29.6	-	29.8	-	29.6	-	29.8	-	29.4	-	29.7	-	29.7	-	29.6	-	29.1	-	29.6	-	30.2
23/08/06	28.8	-	29.2	-	28.7	-	28.6	-	28.8	-	28.8	-	28.8	-	28.7	-	28.7	-	28.7	-	29.1	-	28.9	
25/08/06	29.7	-	29.9	29.4	-	29.6	-	29.6	-	29.4	-	29.7	-	29.4	-	29.3	-	29.1	-	30.1	-	29.9	-	29.5
28/08/06	28.8	-	29.2	28.8	-	29.3	29.0	-	29.4	-	29.4	-	29.1	-	29.4	-	29.1	-	29.4	-	30.6	-	29.6	
30/08/06	27.2	-	27.3	-	27.5	-	27.3	-	27.5	-	27.5	-	27.4	-	27.4	-	27.3	-	27.4	-	27.4	-	27.5	

### 7. Suspended Solids

Date	Suspended Solids (mg/L)																								
	C1						M1						M2						C2						
	Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		
	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	
7/08/06	3.3	-	3.3	-	3.2	-	3.2	-	3.5	-	3.5	-	3.0	-	3.0	-	3.0	-	3.5	-	3.5	-	3.0	-	2.8
9/08/06	2.5	-	3.2	2.9	2.5	-	3.0	2.8	-	3.0	3.0	-	3.5	3.5	-	3.5	3.5	-	3.5	3.5	-	3.0	3.0	-	2.8
11/08/06	3.5	-	3.3	3.4	4.0	-	3.5	3.8	-	3.5	3.5	-	3.0	3.0	-	3.5	3.0	-	3.5	3.0	-	3.0	3.4	-	3.1
14/08/06	2.5	-	2.5	-	2.5	-	2.5	-	2.5	-	2.5	-	2.7	-	2.5	-	2.5	-	2.5	-	2.5	-	2.5	-	2.8
16/08/06	3.5	-	3.0	3.3	-	3.5	-	3.5	-	4.0	-	4.0	-	4.0	-	4.0	-	4.0	-	4.3	-	4.3	-	3.0	
18/08/06	2.5	-	3.2	2.9	3.5	-	3.5	3.5	-	3.5	-	3.5	-	3.5	-	3.5	-	3.5	-	3.5	-	3.2	-	3.0	
21/08/06	2.5	-	3.0	2.8	2.0	-	2.3	2.2	-	2.4	-	2.3	-	2.3	-	2.3	-	2.3	-	1.5	-	1.5	-	2.0	
23/08/06	3.5	-	3.2	3.4	-	4.3	-	4.4	-	4.4	-	5.0	-	4.0	-	4.3	-	4.3	-	4.3	-	3.0	-	3.5	
25/08/06	2.4	-	2.5	2.5	2.0	-	2.2	2.1	-	2.5	-	2.3	-	2.3	-	2.3	-	2.3	-	2.3	-	3.0	-	2.8	
28/08/06	3.5	-	3.0	3.3	4.0	-	3.5	3.8	3.5	-	3.5	3.5	-	3.3	-	4.0	-	4.0	-	4.0	-	4.0	-	3.5	
30/08/06	4.2	-	3.2	3.7	-	2.5	-	4.2	-	4.2	-	3.5	-	3.5	-	3.5	-	3.5	-	3.2	-	3.2	-	3.0	

### 8. Turbidity

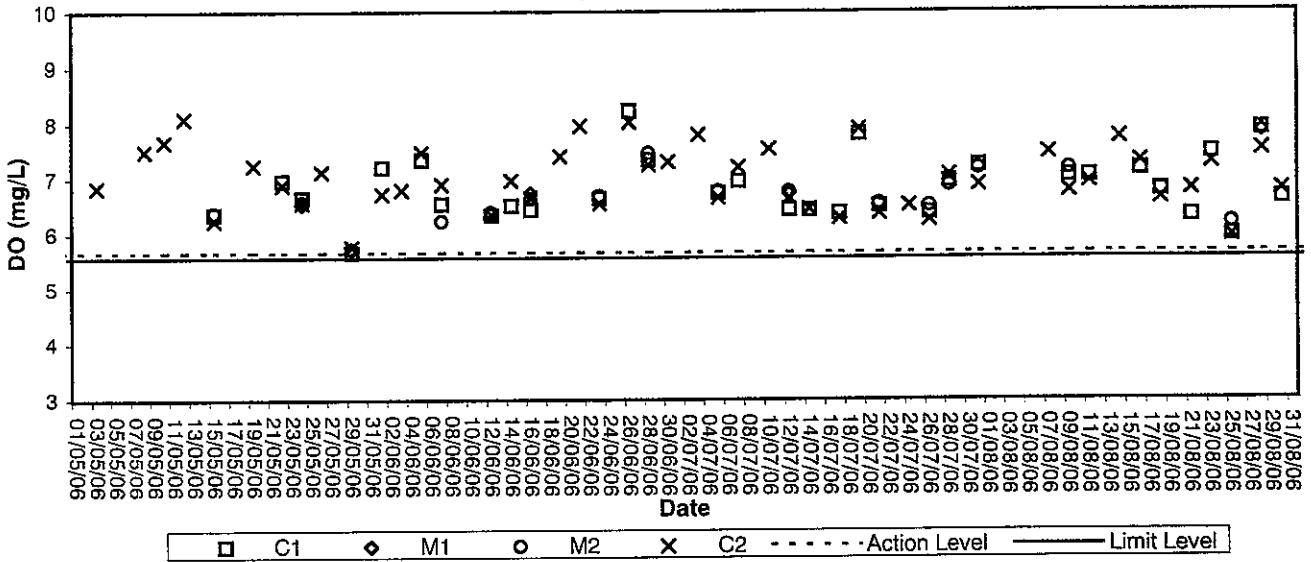
Date	Turbidity (NTU)																									
	C1						M1						M2						C2							
	Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb		Flood		Ebb			
	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave	S	M	B	Ave		
7/08/06	2.83	-	2.83	-	2.98	-	2.98	-	2.92	-	3.05	-	3.15	-	3.13	-	3.13	-	3.13	-	3.08	-	2.83	-	2.95	
9/08/06	2.44	-	2.95	2.70	2.33	-	2.66	2.50	-	2.74	-	2.25	3.15	-	3.34	3.25	-	3.26	2.55	-	2.26	2.41	2.44	-	2.06	
11/08/06	3.21	-	2.87	3.04	3.59	-	3.28	3.44	-	3.03	-	3.46	-	3.33	-	3.30	-	3.30	-	3.30	-	2.70	2.79	3.93	-	3.03
14/08/06	2.31	-	2.31	-	2.45	-	2.45	-	2.61	-	2.79	-	2.77	-	2.82	-	2.82	-	2.82	-	2.56	-	2.32	-	2.44	
16/08/06	3.21	-	2.90	3.06	-	3.43	-	3.43	-	4.27	-	4.93	-	4.70	-	4.60	-	4.60	-	4.60	-	3.18	-	3.09		
18/08/06	2.77	-	3.08	2.93	3.38	-	3.22	3.30	-	3.14	-	3.28	-	3.43	-	3.13	-	3.13	-	2.98	-	2.83	-	2.95		
21/08/06	1.99	-	2.70	2.35	1.70	-	2.42	2.06	-	2.02	-	2.46	-	1.72	-	1.67	-	1.67	-	1.20	-	2.50	-	2.15		
23/08/06	3.68	-	3.73	3.71	-	4.06	-	4.06	-	4.49	-	4.99	-	4.27	-	4.27	-	4.27	-	4.27	-	3.73	-	3.82		
25/08/06	2.07	-	2.14	2.11	1.74	-	2.03	1.89	-	2.23	-	2.04	-	2.14	-	2.14	-	2.14	-	2.87	-	2.75	-	2.85		
28/08/06	3.74	-	3.56	3.65	3.68	-	3.51	3.60	3.47	-	3.51	-	3.68	-	3.84	-	3.84	-	3.63	-	3.63	-	3.42			
30/08/06	3.68	-	3.30	3.49	-	2.97	-	3.95	-	3.95	-	3.32	-	3.57	-	3.55	-	3.55	-	2.95	-	2.87	-	2.99		

## **Appendix D**

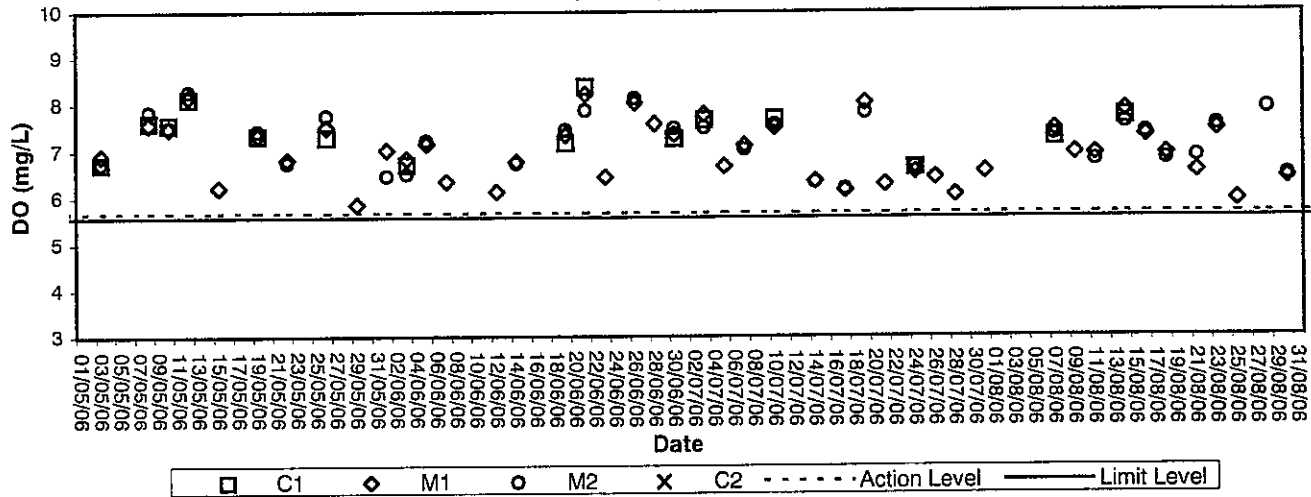
### **Graphical Plots of Marine Water Monitoring Data**



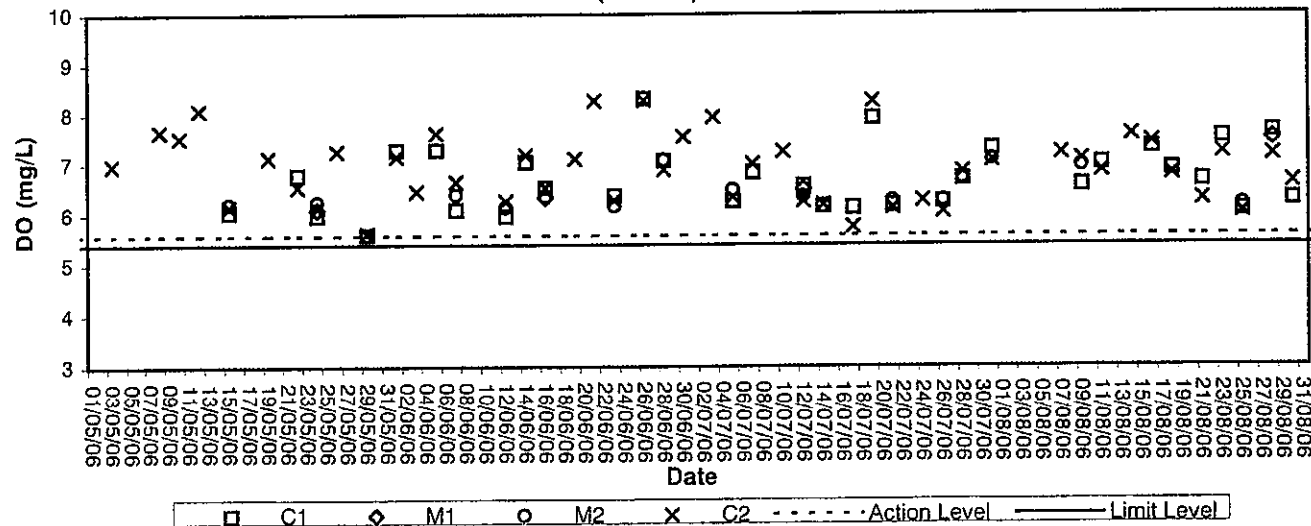
DO content (Surface) at mid-flood tide



DO content (Middle) at mid-flood tide

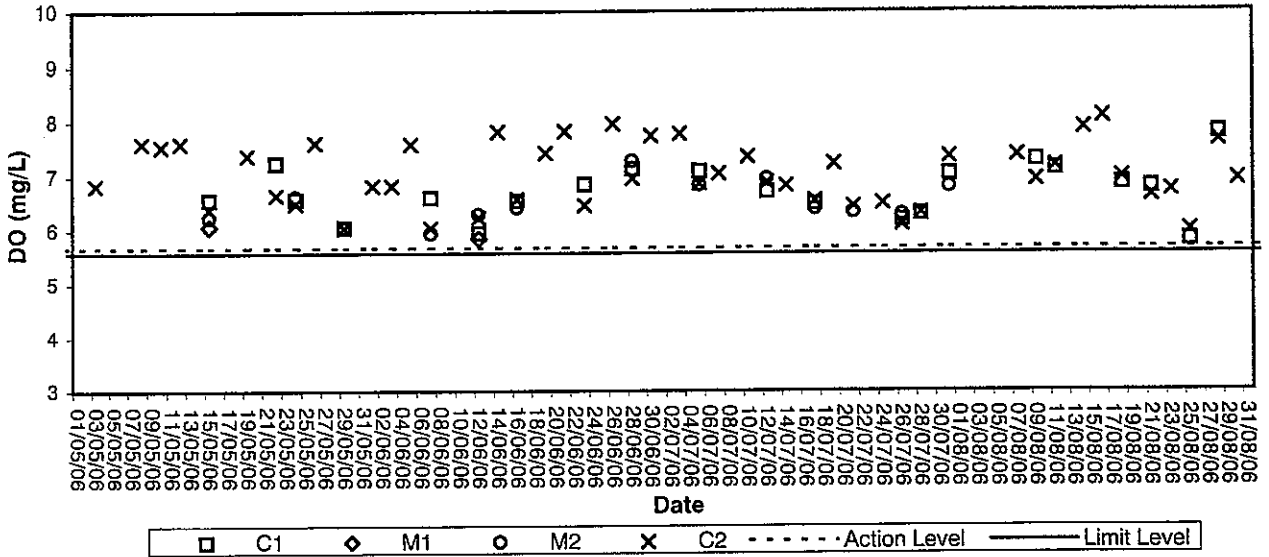


DO content (Bottom) at mid-flood tide

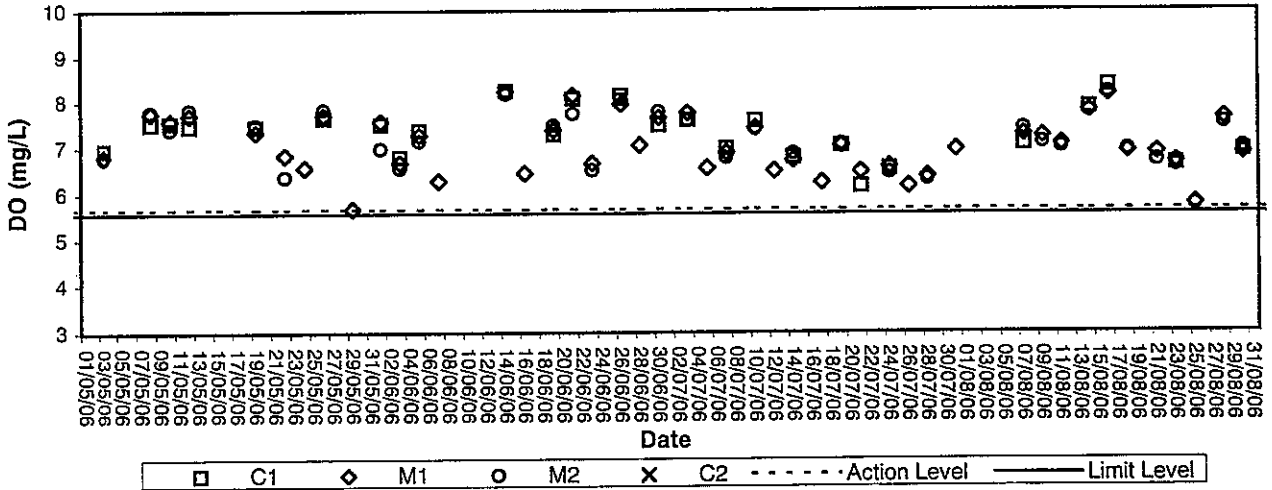




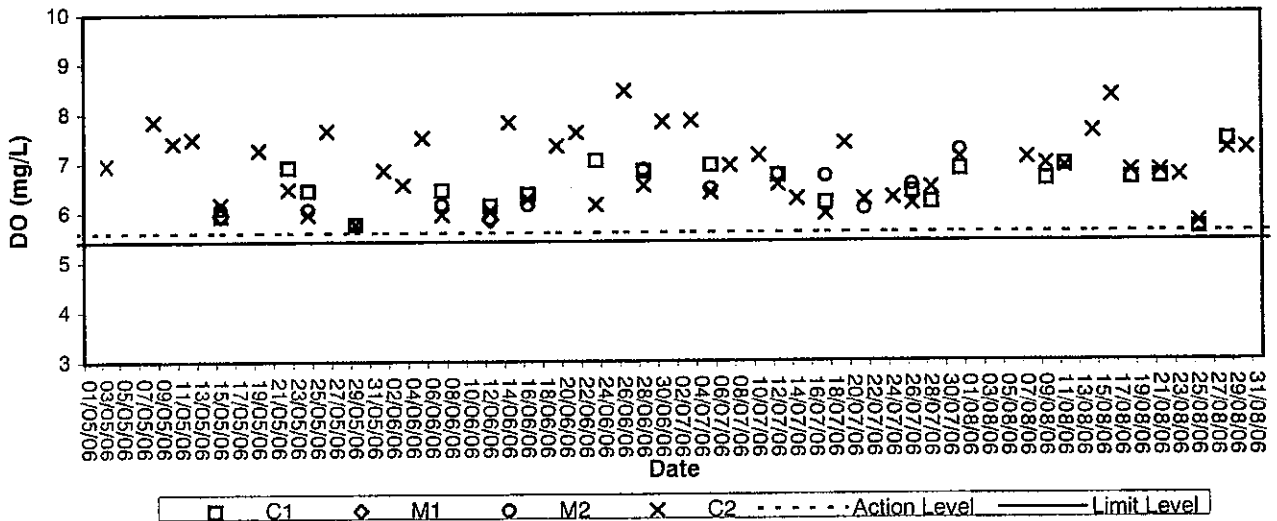
DO content (Surface) at mid-ebb tide



DO content (Middle) at mid-ebb tide

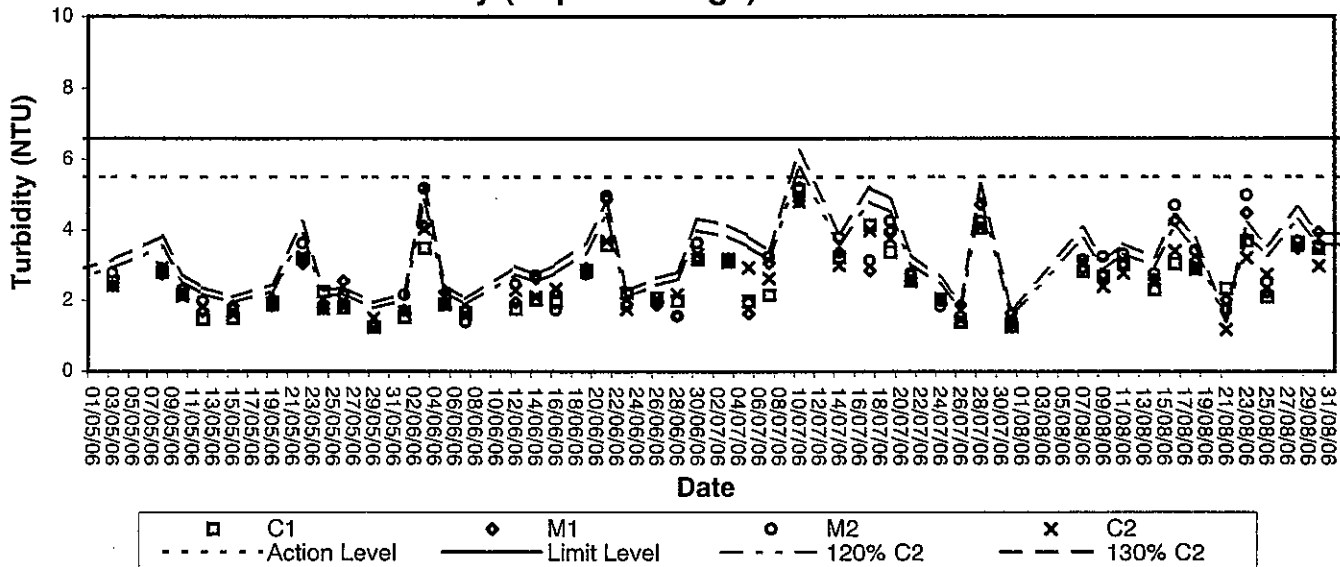


DO content (Bottom) at mid-ebb tide

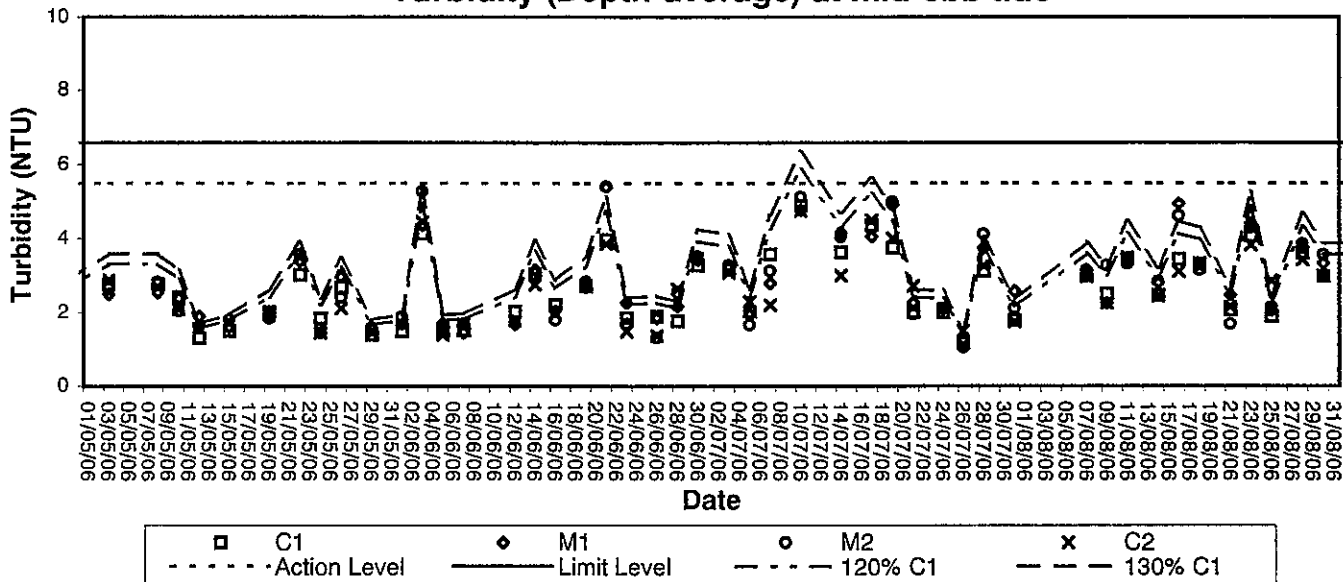




### Turbidity (Depth-average) at mid-flood tide

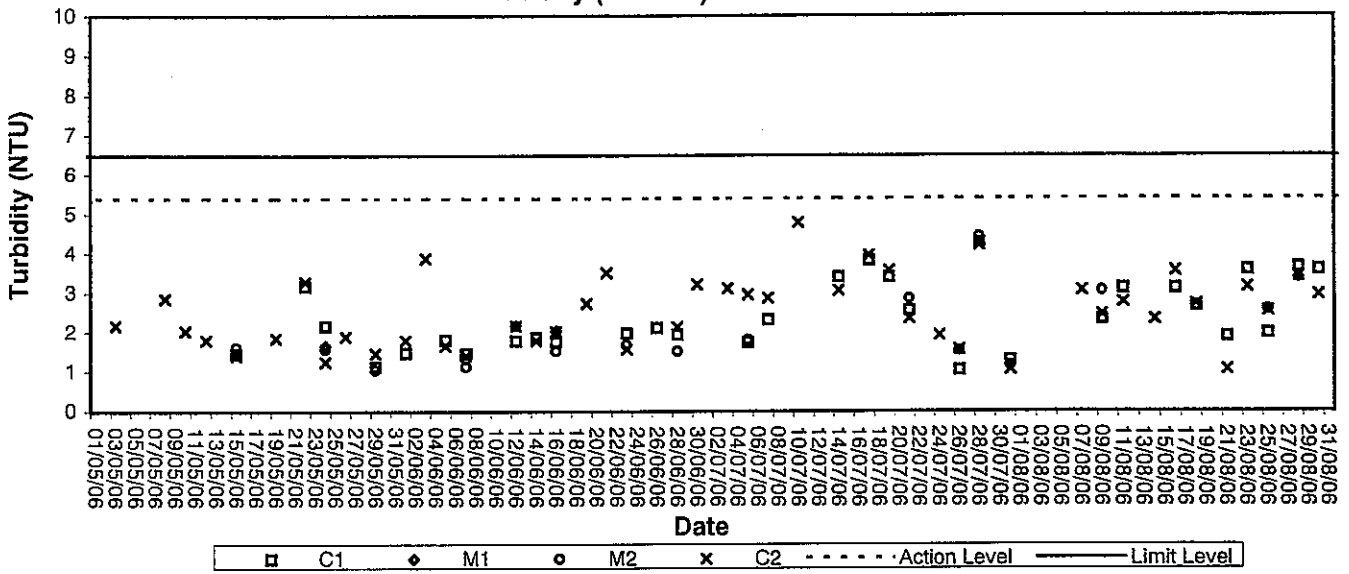


### Turbidity (Depth-average) at mid-ebb tide

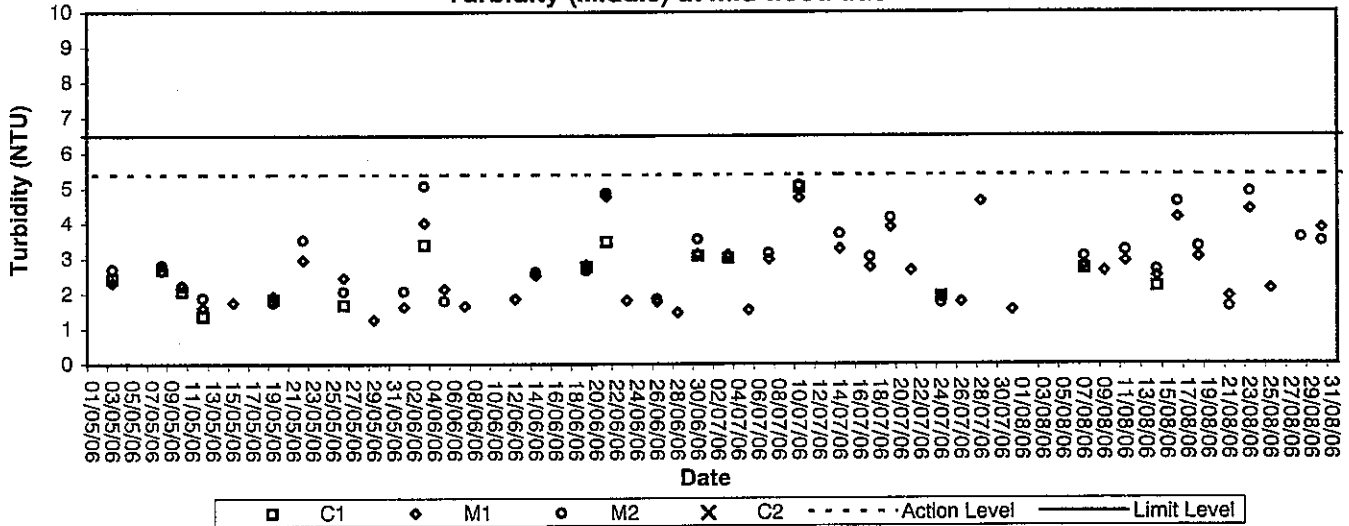




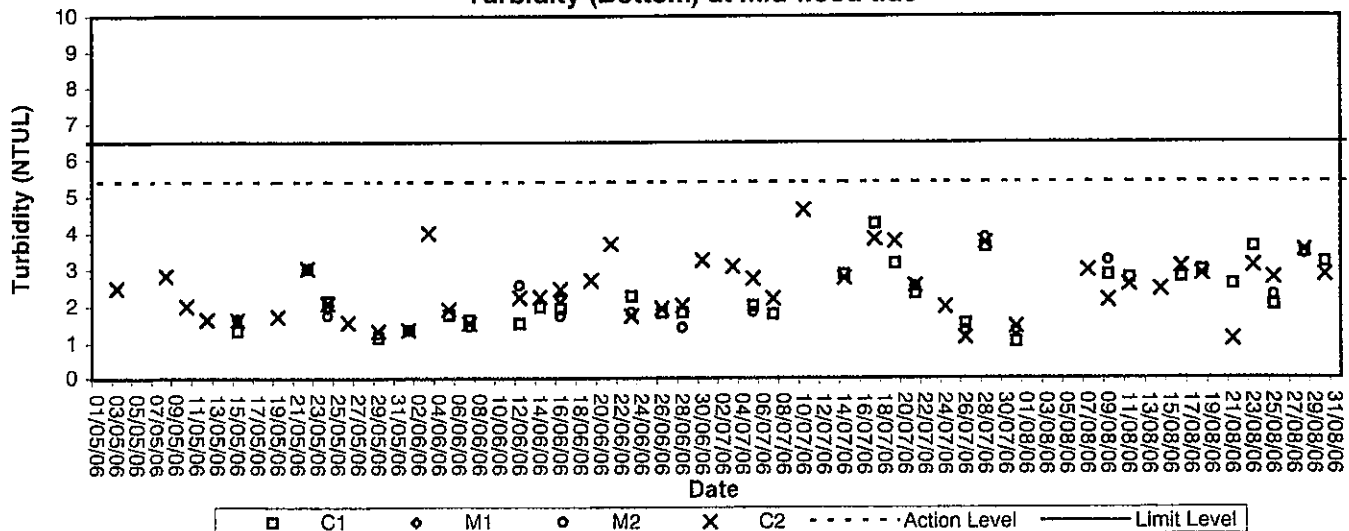
Turbidity (Surface) at mid-flood tide



Turbidity (Middle) at mid-flood tide

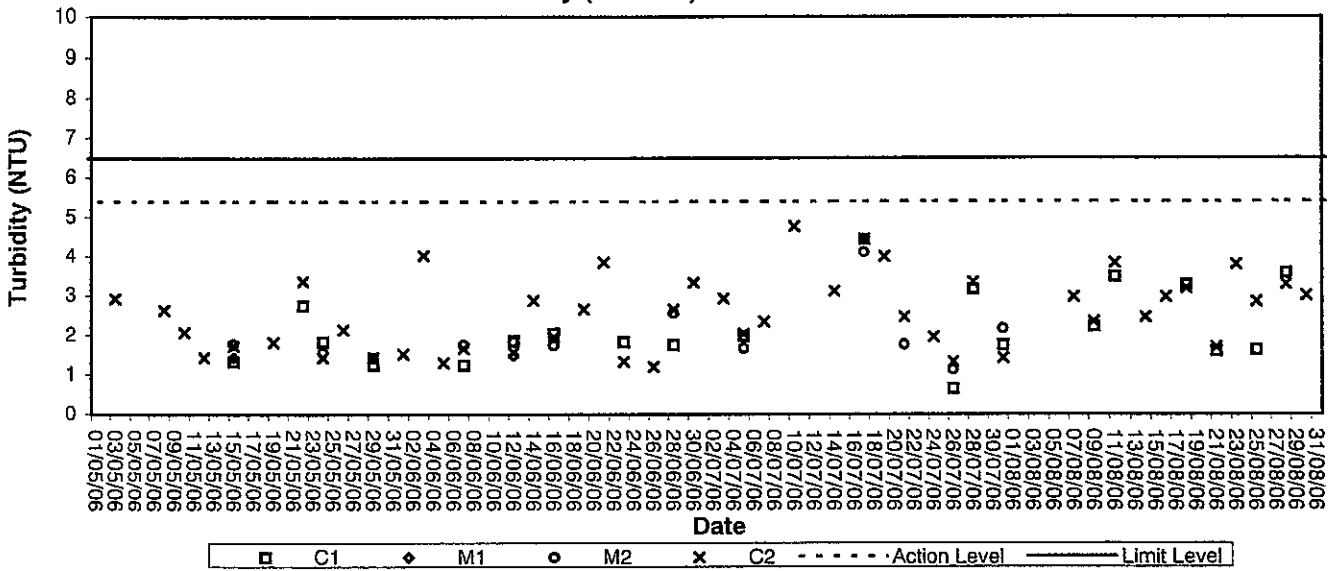


Turbidity (Bottom) at mid-flood tide

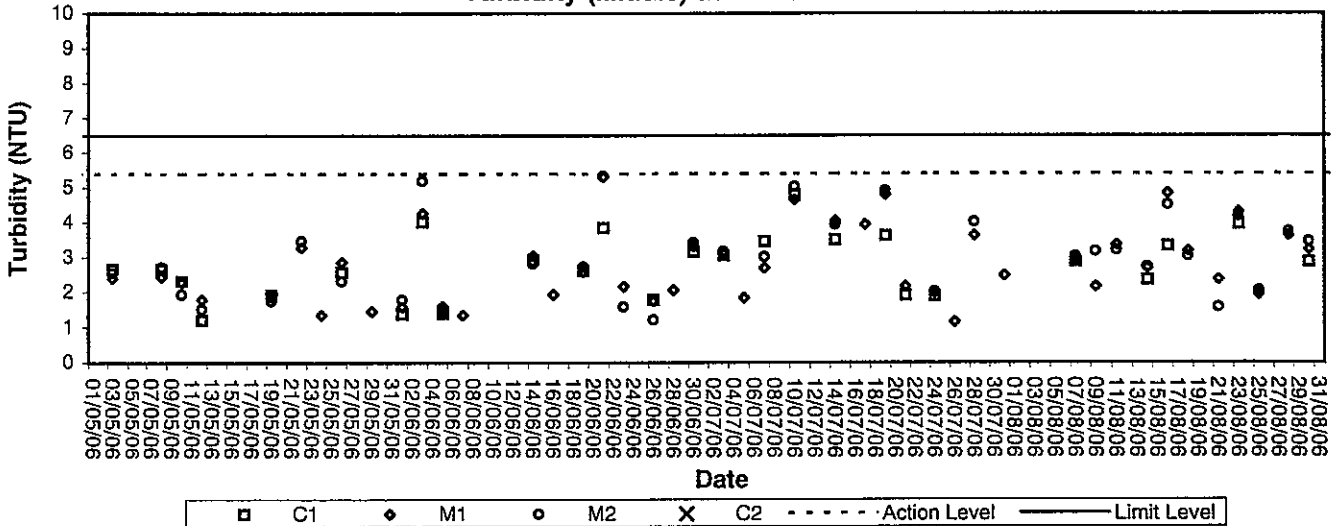




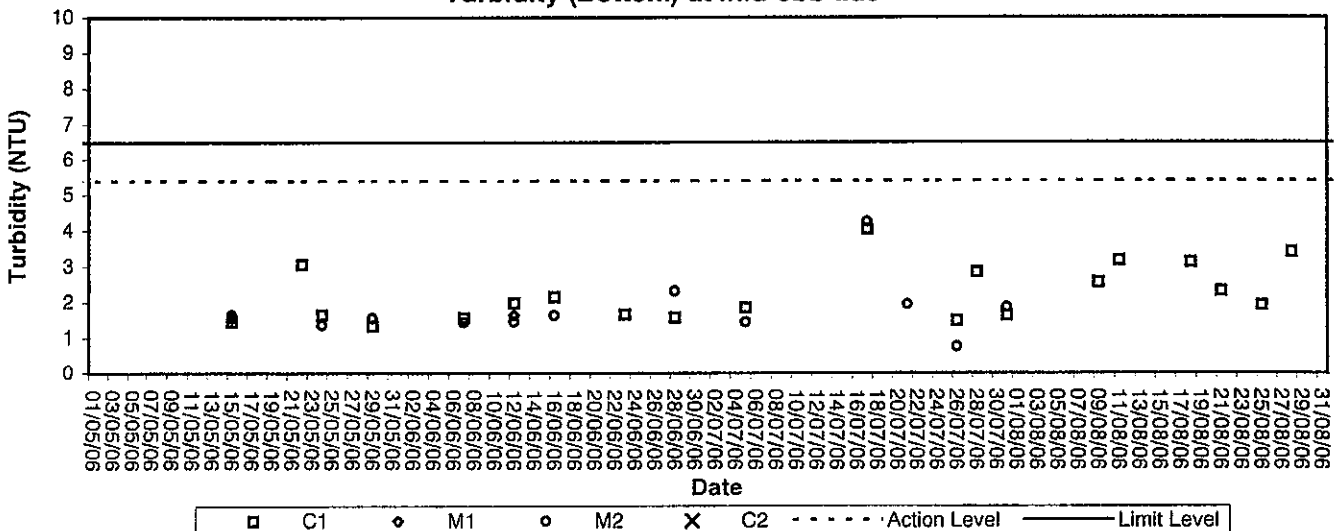
Turbidity (Surface) at mid-ebb tide



Turbidity (Middle) at mid-ebb tide

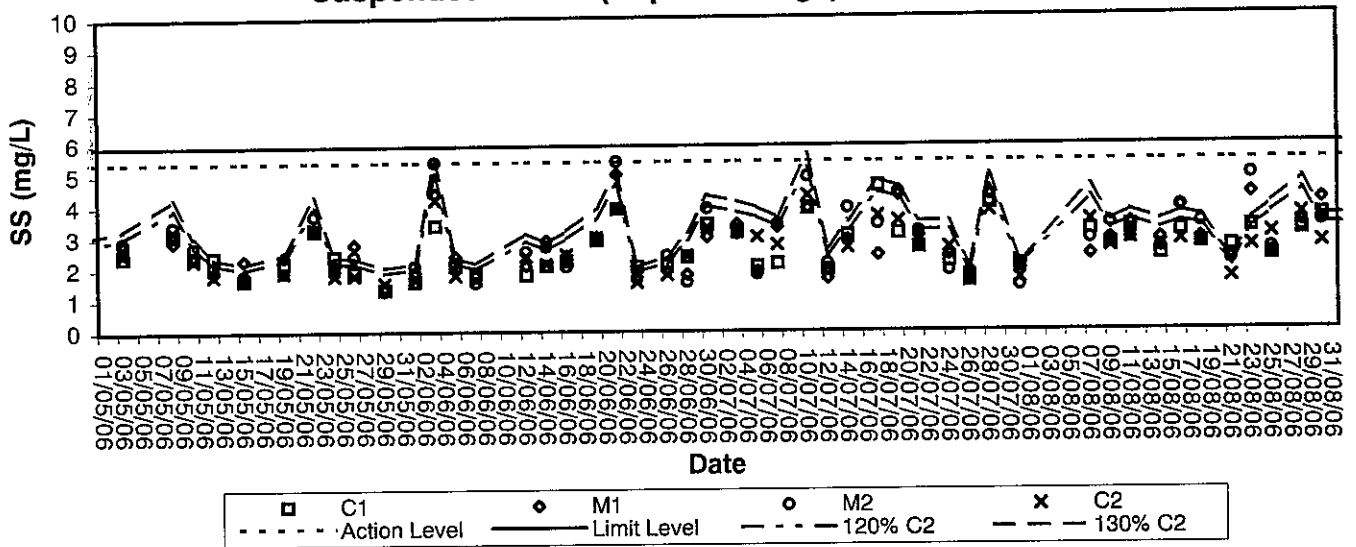


Turbidity (Bottom) at mid-ebb tide

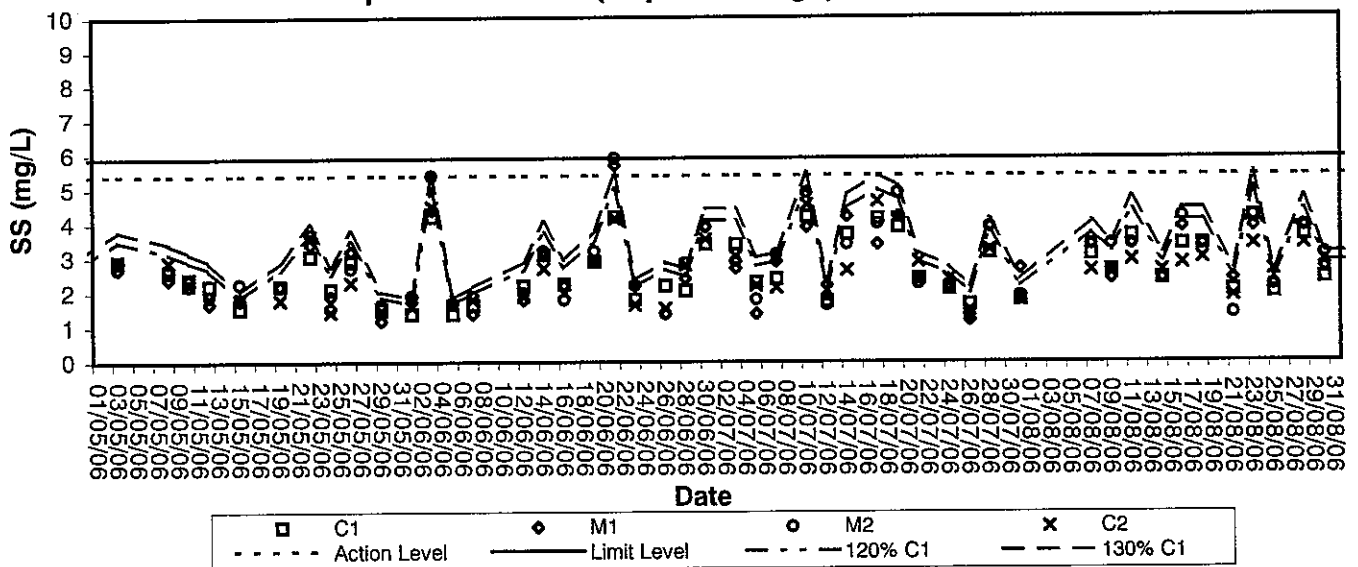




### Suspended Solids (Depth-average) at mid-flood tide



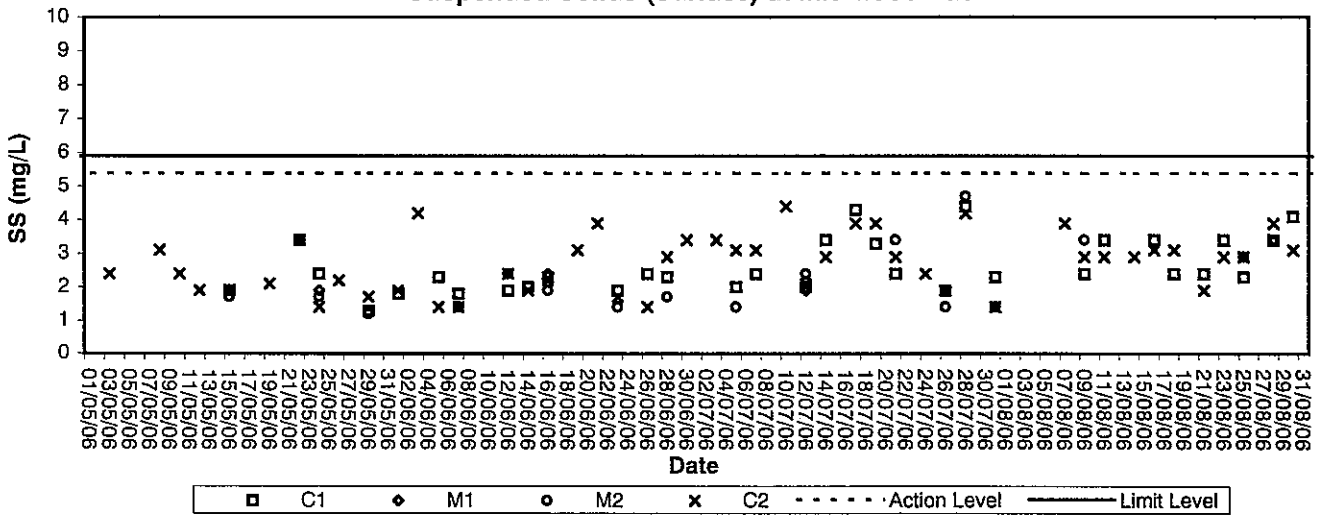
### Suspended Solids (Depth-average) at mid-ebb tide



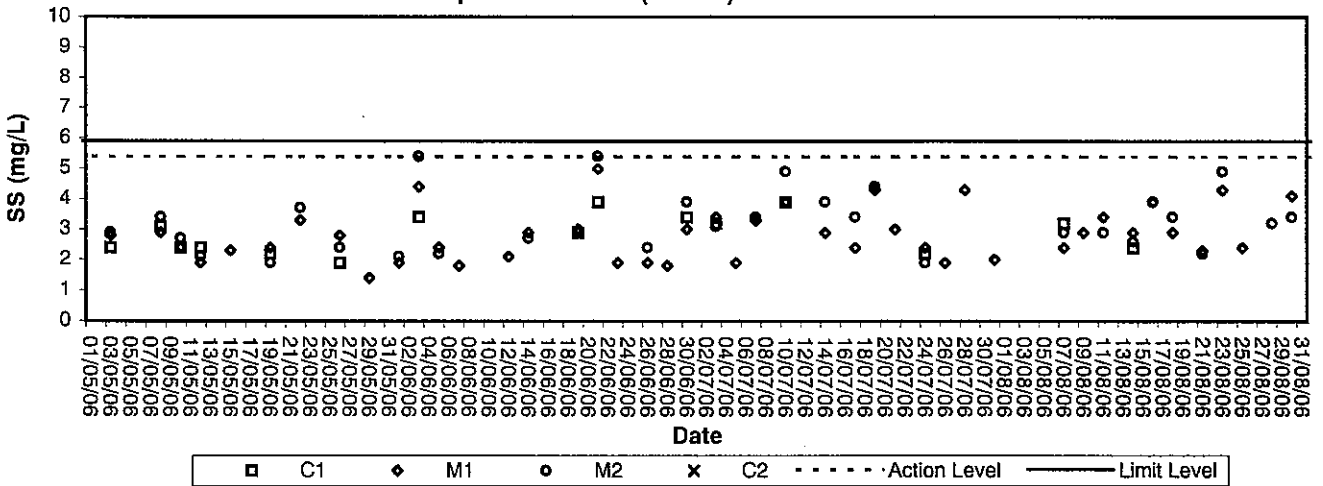




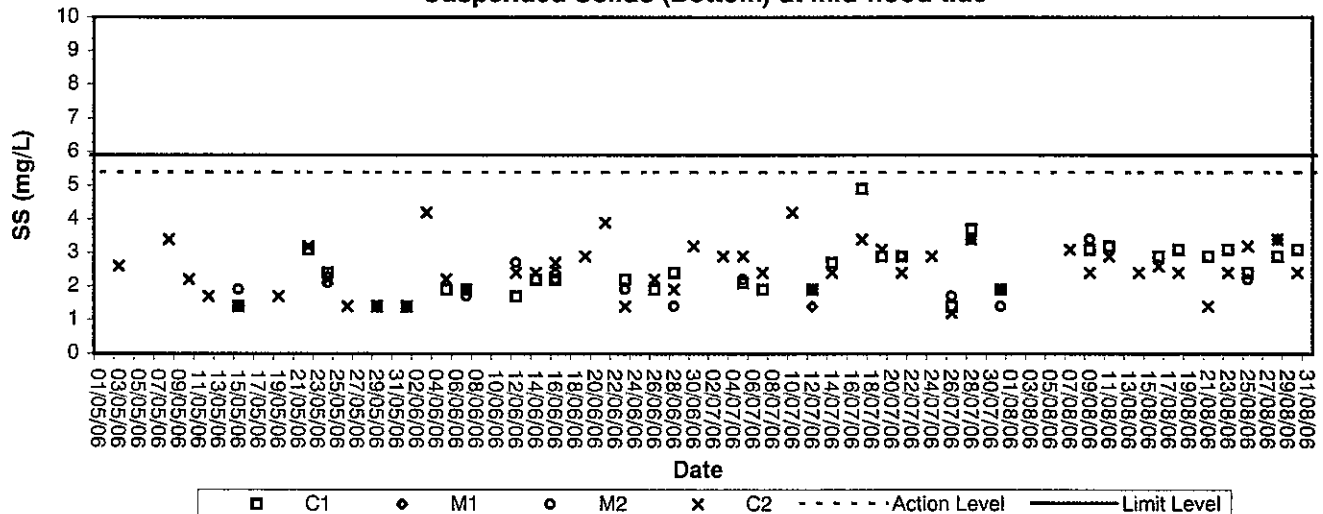
Suspended Solids (Surface) at mid-flood tide

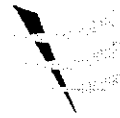


Suspended Solids (Middle) at mid-flood tide

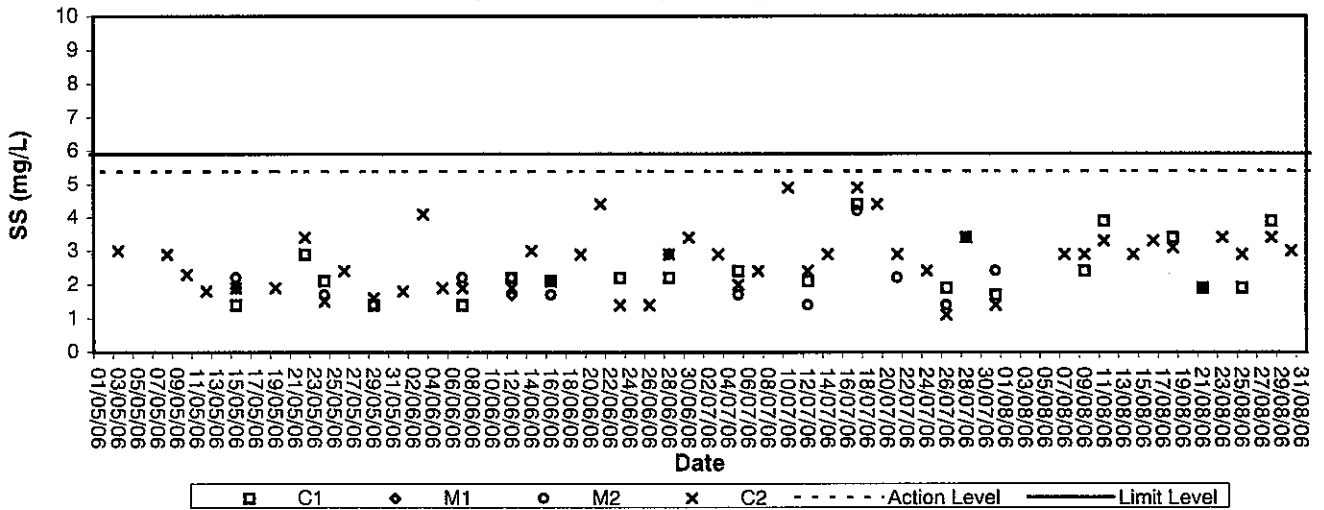


Suspended Solids (Bottom) at mid-flood tide

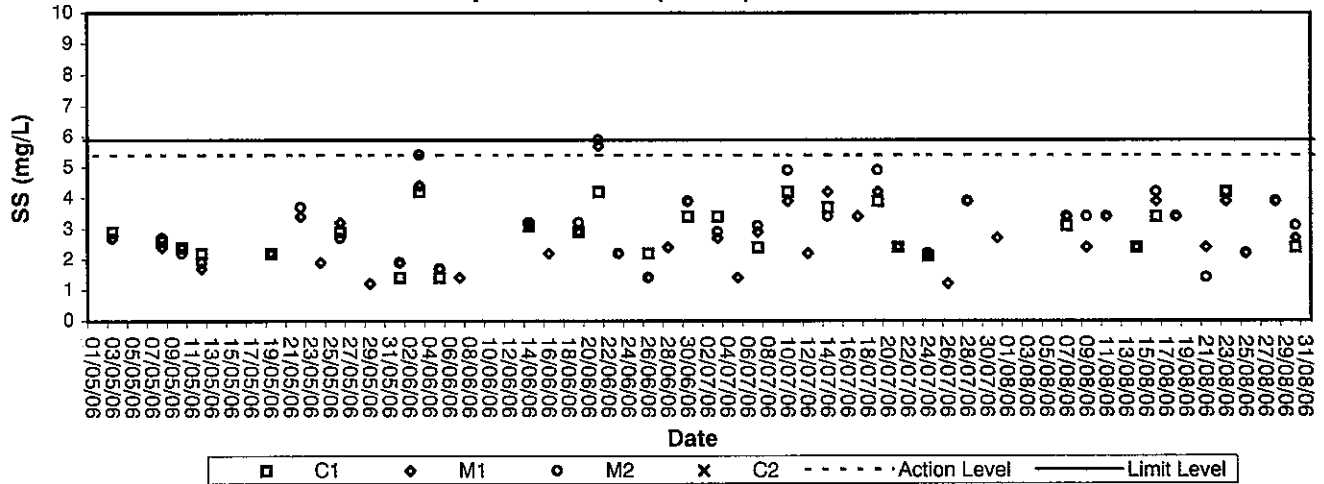




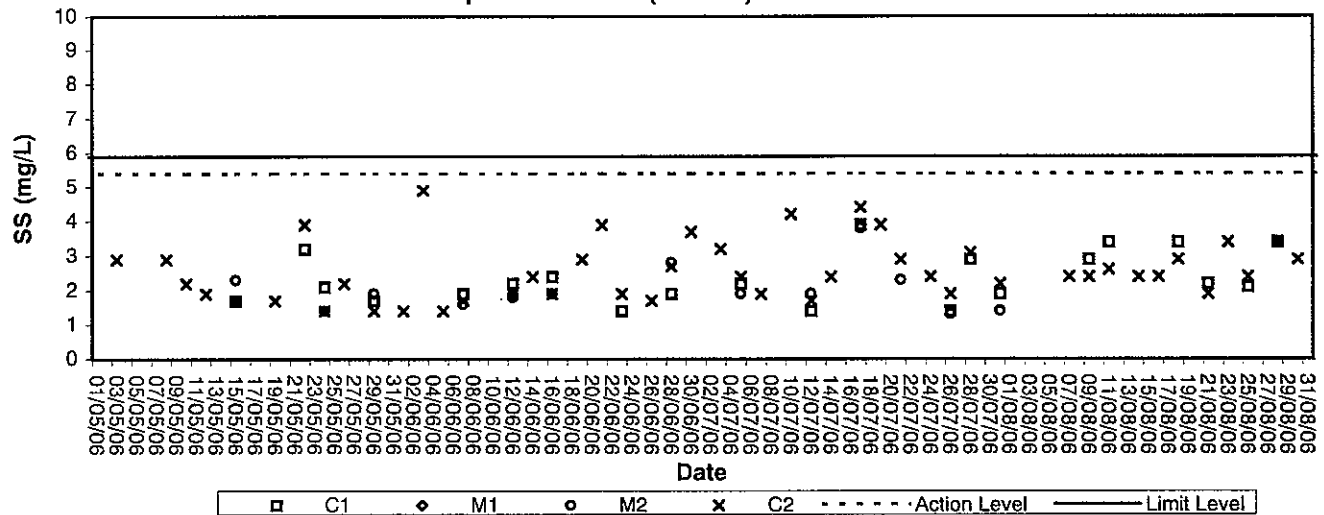
Suspended Solids (Surface) at mid-ebb tide



Suspended Solids (Middle) at mid-ebb tide



Suspended Solids (Bottom) at mid-ebb tide





## **Appendix E**

### **QA/QC Results of Laboratory Analysis**



## QA/QC Results of Laboratory Analysis of Total Suspended Solids

Sampling Date	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
07/08/06	95.4	C1F-M	0.0	M1F-M	103.2
	103.8	C2F-M	0.0	C2E-S	111.3
	97.8	C2E-B	0.0	M2E-M	107.1
09/08/06	97.2	C1F-D	0.0	M1F-M	100.0
	107.0	M2F-S	0.0	C2E-S	101.6
	103.5	C2E-B	0.0	M2E-M	96.4
11/08/06	98.8	C1F-S	0.0	M1F-M	98.2
	102.0	M2F-M	0.0	C2E-S	106.7
	94.2	C2E-B	0.0	M2E-M	101.5
14/08/06	99.4	C1F-M	0.0	M1F-M	103.6
	96.5	M2F-M	0.0	C2E-S	101.7
	106.2	C2E-B	0.0	M2E-M	103.4
16/08/06	99.6	C1F-S	0.0	M1F-M	104.4
	93.3	C1E-M	0.0	C2E-S	102.3
	92.5	C2E-B	0.0	M2E-B	102.3
18/08/06	102.3	C1F-S	0.0	M1F-M	94.8
	98.2	M2F-M	0.0	C2E-S	107.3
	105.4	C2E-B	0.0	M2E-M	103.5
21/08/06	102.3	C1F-S	0.0	M1F-M	98.3
	96.8	M2F-M	0.0	C2E-S	93.2
	95.4	C2F-B	0.0	M2E-B	92.5
23/08/06	94.5	C1F-S	0.0	M1F-M	93.8
	107.8	M2F-M	0.0	C2E-S	101.5
	104.9	C2F-B	0.0	M2E-B	92.9
25/08/06	94.2	C1F-S	0.0	M1F-M	105.9
	95.2	M2F-S	0.0	C2E-S	91.9
	99.0	C2E-B	0.0	M2E-B	94.7
28/08/06	103.1	C1F-S	0.0	M1F-M	106.2
	106.3	M2F-B	0.0	C2E-S	100.0
	106.2	C2E-B	0.0	M2E-B	94.1
30/08/06	105.5	C1F-S	0.0	M1F-M	98.5
	104.0	M2F-S	0.0	C2E-S	98.3
	97.7	C2E-B	0.0	M2E-B	94.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between -10% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.



## **Appendix F**

### **Site Inspection Record Sheets**




Contract No.: CV/2004/04  
Improvement works to Tung Ping Chau Public Pier

### SITE INSPECTION CHECKLIST

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Mitigation Measures on Environmental Management</b>				
<b>Waste Management</b>				
• Most of the C&D materials generated from the construction are sorted immediately in-situ to find out if they can be re-used for this job site or for other job sites.	/			
• Recyclable materials sorted from the site should be collected by potential recycling contractors under the Contractor's arrangement.	/			
• Trip ticket system will be implemented to ensure proper waste disposal at public filling and landfills.	/			
• Proper resource planning and calculations before ordering the construction materials to be used will ensure that the wastage of the materials can be minimized.	/			
• Any unused materials or those with remaining functional capacity should be recycled.	/			
• Office wastes are reduced through recycling of paper if volumes are large enough to warrant collection.	/			
• Handling and storing wastes should be in a manner which ensures that they are held securely without loss or leakage, thereby minimising the potential for pollution.	/			
<b>Site Practice</b>				
• The Contractor assigned worker is responsible for good site practices, arrangements for collection and effective disposal of all wastes generated at the site.	/			
• No dredging and dumping activities shall be carried out for the Project within the site boundary.	/			
• All generators, fuel and oil storage are within bundle areas.	/			
• Oil leakage from machinery, vehicle and plant is prevented.	/			
• Maintain and clean the chemical and waste storage areas regularly.	/			
• General refuse generated on-site is in enclosed bins or compaction units and removed on daily or every second day basis.	/			

Contract No.: CV/2004/04  
 Improvement works to Tung Ping Chau Public Pier

**SITE INSPECTION CHECKLIST**

Inspection Date : 16/8/06  
 Time : 15:00  
 Weather : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy  
 Condition : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Inspected by : Mak Jui Wai  
 Signature :   
 Temperature : 32  
 Humidity : High / Moderate / Low

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Mitigation Measures on Environmental Management</b>				
<b>Air Quality</b>				
Any material which has the potential to create dust should be sprayed with water.	/			
Unpaved areas should be watered regularly to avoid dust generation.	/			
The enclosures should be around the main dust-generating activities.	/			
All plant and equipment should be well maintained e.g. without black smoke emission.	/			
Open burning should be prohibited.	/			
<b>Water Quality</b>				
Silt curtain should be installed enclosing the catwalk supporting columns foundation works area at all time throughout construction of foundation to minimize water quality impact.	/			
Decommissioning of silt curtain shall be properly controlled to avoid sudden dispersion of large quantity of muddy waters.	/			
The works should cause no visible foam, oil, grease, scum litter or other objectionable matter to be present on the water within the site.	/			
No wastewater arising from the construction activities shall be discharged within the site boundary.	/			
All barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of materials.	/			
Loading of barges should be controlled to prevent splashing of materials to the surrounding water and the barges shall not be filled to a level which will cause overflowing of material or polluted water during loading or transportation.	/			
Mechanical grabs should be designed and maintained to avoid spillage and should be seal tightly while being lifted.	/			
All vessels should be sized such that adequate clearance is maintained between vessel and the sea bed to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller on the water within the site.	/			
Fuel tanks should be housed within drainable trays and regularly drained of rain water.	/			

**SITE INSPECTION CHECKLIST**

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Mitigation Measures on Environmental Management</b>				
<b>Waste Management</b>				
• Most of the C&D materials generated from the construction are sorted immediately in-situ to find out if they can be re-used for this job site or for other job sites.	/			
• Recyclable materials sorted from the site should be collected by potential recycling contractors under the Contractor's arrangement.	/			
• Trip ticket system will be implemented to ensure proper waste disposal at public filling and landfills.	/			
• Proper resource planning and calculations before ordering the construction materials to be used will ensure that the wastage of the materials can be minimized.	/			
• Any unused materials or those with remaining functional capacity should be recycled.	/			
• Office wastes are reduced through recycling of paper if volumes are large enough to warrant collection.	/			
• Handling and storing wastes should be in a manner which ensures that they are held securely without loss or leakage, thereby minimising the potential for pollution.	/			
<b>Site Practice</b>				
• The Contractor assigned worker is responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	/			
• No dredging and dumping activities shall be carried out for the Project within the site boundary.	/			
• All generators, fuel and oil storage are within bundle areas.	/			
• Oil leakage from machinery, vehicle and plant is prevented.	/			
• Maintain and clean the chemical and waste storage areas regularly.	/			
• General refuse generated on-site is in enclosed bins or compaction units and removed on daily or every second day basis.	/			



Contract No.: CV/2004/04  
Improvement works to Tung Ping Chau Public Pier

**SITE INSPECTION CHECKLIST**

Inspection Date : 23/8/06  
 Time : 15:00  
 Weather : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy  
 Condition : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / (Light) / Breeze / Strong  
 Inspected by : Mark See Wan  
 Name : Mark See Wan  
 Signature : Mark  
 Temperature : 32  
 Humidity : (High) / Moderate / Low

	Implementation Stages*		Remark
	Yes	No	
<b>Mitigation Measures on Environmental Management</b>			
<b>Air Quality</b>			
Any material which has the potential to create dust should be sprayed with water.	/		
Unpaved areas should be watered regularly to avoid dust generation.	/		
The enclosures should be around the main dust-generating activities.	/		
All plant and equipment should be well maintained e.g. without black smoke emission.	/		
Open burning should be prohibited.	/		
<b>Water Quality</b>			
Silt curtain should be installed enclosing the catwalk supporting columns foundation works area at all time throughout construction of foundation to minimize water quality impact.	/		
Decommissioning of silt curtain shall be properly controlled to avoid sudden dispersion of large quantity of muddy waters.	/		
The works should cause no visible foam, oil, grease, scum litter or other objectionable matter to be present on the water within the site.	/		
No wastewater arising from the construction activities shall be discharged within the site boundary.	/		
All barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of materials.	/		
Loading of barges should be controlled to prevent splashing of materials to the surrounding water and the barges shall not be filled to a level which will cause overflowing of material or polluted water during loading or transportation.	/		
Mechanical grabs should be designed and maintained to avoid spillage and should be seal tightly while being lifted.	/		
All vessels should be sized such that adequate clearance is maintained between vessel and the sea bed to ensure that undus turbidity is not generated by turbulence from vessel movement or propeller on the water within the site.	/		
Fuel tanks should be housed within drainable trays and regularly drained of rain water.	/		



**SITE INSPECTION CHECKLIST**

	Mitigation Measures on Environmental Management	Implementation Stages*			Remark
		Yes	No	N/A	
<b>Waste Management</b>					
•	Most of the C&D materials generated from the construction are sorted immediately in-situ to find out if they can be re-used for this job site or for other job sites.	/			
•	Recyclable materials sorted from the site should be collected by potential recycling contractors under the Contractor's arrangement.	/			
•	Trip ticket system will be implemented to ensure proper waste disposal at public filling and landfills.	/			
•	Proper resource planning and calculations before ordering the construction materials to be used will ensure that the wastage of the materials can be minimized.	/			
•	Any unused materials or those with remaining functional capacity should be recycled.	/			
•	Office wastes are reduced through recycling of paper if volumes are large enough to warrant collection.	/			
•	Handling and storing wastes should be in a manner which ensures that they are held securely without loss or leakage, thereby minimising the potential for pollution.	/			
<b>Site Practice</b>					
•	The Contractor assigned worker is responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	/			
•	No dredging and dumping activities shall be carried out for the Project within the site boundary.	/			
•	All generators, fuel and oil storage are within bundle areas.	/			
•	Oil leakage from machinery, vehicle and plant is prevented.	/			
•	Maintain and clean the chemical and waste storage areas regularly.	/			
•	General refuse generated on-site is in enclosed bins or compaction units and removed on daily or every second day basis.	/			



Contract No.: CV/2004/04  
Improvement works to Tung Ping Chau Public Pier

**SITE INSPECTION CHECKLIST**

Inspection Date : 30/8/06  
 Time : 11:00  
 Inspected by : Mak Jui Wai  
 Signature : Mak  
 Weather : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy  
 Condition : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 32  
 Humidity : High / Moderate / Low

	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Mitigation Measures on Environmental Management</b>				
<b>Air Quality</b>				
Any material which has the potential to create dust should be sprayed with water.	/			
Unpaved areas should be watered regularly to avoid dust generation.	/			
The enclosures should be around the main dust-generating activities.	/			
All plant and equipment should be well maintained e.g. without black smoke emission.	/			
Open burning should be prohibited.	/			
<b>Water Quality</b>				
Silt curtain should be installed enclosing the catwalk supporting columns foundation works area at all time throughout construction of foundation to minimize water quality impact.	/			
Decommissioning of silt curtain shall be properly controlled to avoid sudden dispersion of large quantity of muddy waters.	/			
The works should cause no visible foam, oil, grease, scum litter or other objectionable matter to be present on the water within the site.	/			
No wastewater arising from the construction activities shall be discharged within the site boundary.	/			
All barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of materials.	/			
Loading of barges should be controlled to prevent splashing of materials to the surrounding water and the barges shall not be filled to a level which will cause overflowing of material or polluted water during loading or transportation.	/			
Mechanical grabs should be designed and maintained to avoid spillage and should be seal tightly while being lifted.	/			
All vessels should be sized such that adequate clearance is maintained between vessel and the sea bed to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller on the water within the site.	/			
Fuel tanks should be housed within drainable trays and regularly drained of rain water.	/			



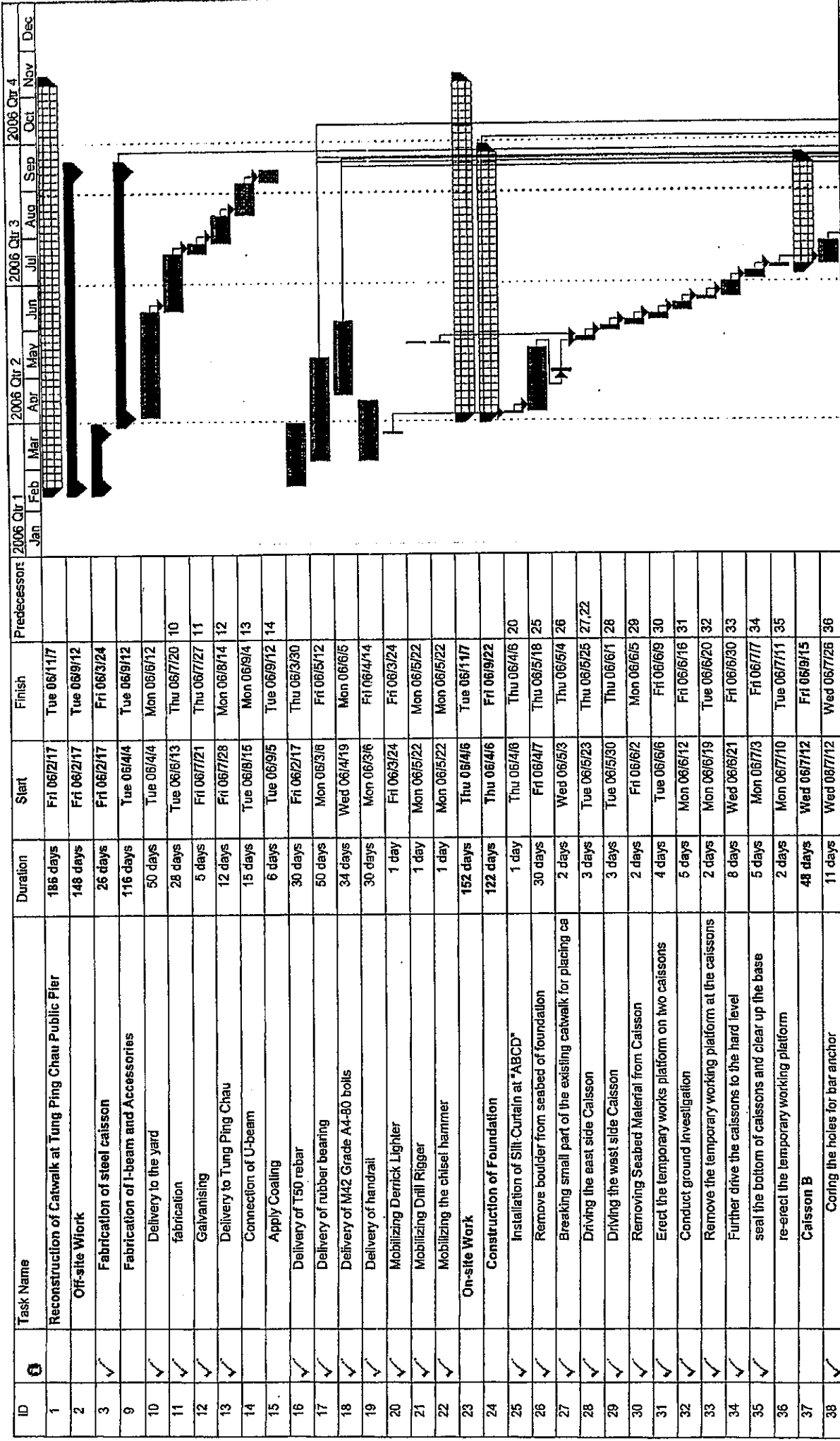
**SITE INSPECTION CHECKLIST**

	Mitigation Measures on Environmental Management	Implementation Stages*			Remark
		Yes	No	N/A	
<b>Waste Management</b>					
•	Most of the C&D materials generated from the construction are sorted immediately in-situ to find out if they can be re-used for this job site or for other job sites.	/			
•	Recyclable materials sorted from the site should be collected by potential recycling contractors under the Contractor's arrangement.	/			
•	Trip ticket system will be implemented to ensure proper waste disposal at public filling and landfills.	/			
•	Proper resource planning and calculations before ordering the construction materials to be used will ensure that the wastage of the materials can be minimized.	/			
•	Any unused materials or those with remaining functional capacity should be recycled.	/			
•	Office wastes are reduced through recycling of paper if volumes are large enough to warrant collection.	/			
•	Handling and storing wastes should be in a manner which ensures that they are held securely without loss or leakage, thereby minimising the potential for pollution.	/			
<b>Site Practice</b>					
•	The Contractor assigned worker is responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	/			
•	No dredging and dumping activities shall be carried out for the Project within the site boundary.	/			
•	All generators, fuel and oil storage are within bundle areas.	/			
•	Oil leakage from machinery, vehicle and plant is prevented.	/			
•	Maintain and clean the chemical and waste storage areas regularly.	/			
•	General refuse generated on-site is in enclosed bins or compaction units and removed on daily or every second day basis.	/			



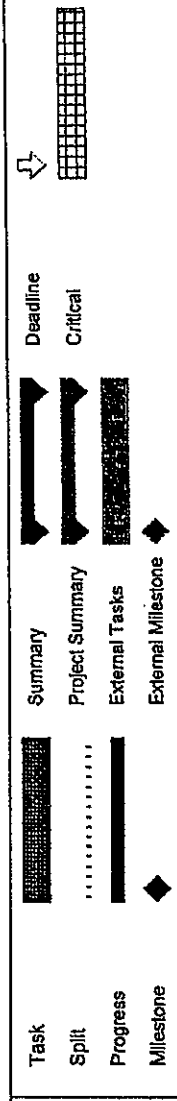
## **Appendix G**

### **Construction Programme**

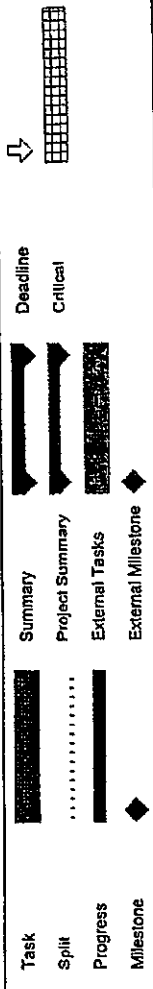
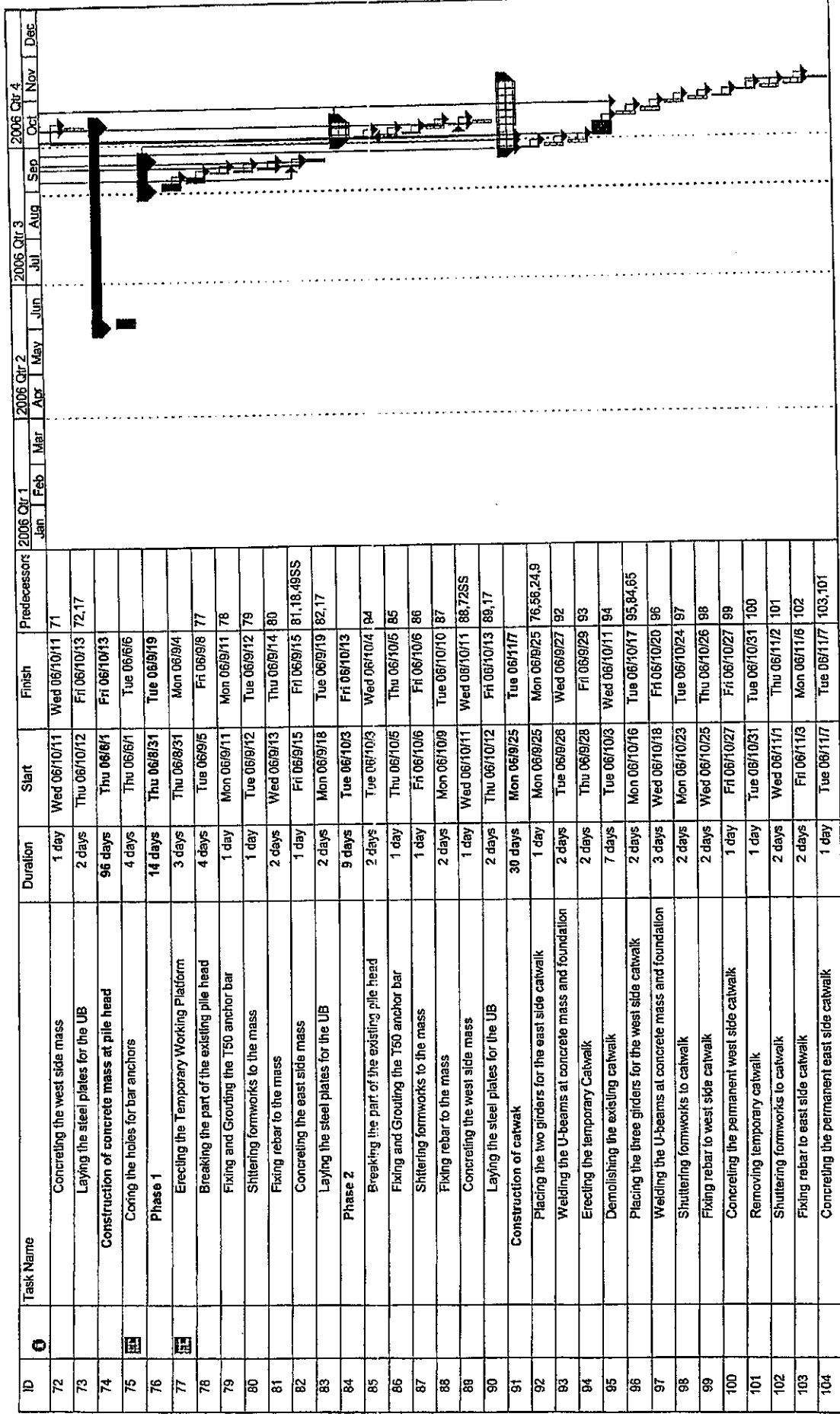


Works Order Program : ME/032/04, Rev.6  
 Reconstruction of Catwalk at Tung Ping Chau Public Pier  
 Updated on: Tue 06/8/29

ID	Task Name	Duration	Start	Finish	Predecessors	2006																	
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
39	Fixing and Grouting the T50 Anchor bar	2 days	Thu 06/7/27	Fri 06/7/28	38																		
40	Coring the holes for bar anchor	5 days	Tue 06/8/22	Mon 06/8/28	45																		
41	Fixing and Grouting the T50 Anchor bar	1 day	Tue 06/8/29	Tue 06/8/29	40																		
42	Pull Out Test for T50 Anchor Bar	2 days	Thu 06/9/14	Fri 06/9/15	39FS+20 day																		
43	Caisson A	30 days	Mon 06/7/31	Fri 06/9/8																			
44	Coring the holes for bar anchor	14 days	Mon 06/7/31	Thu 06/8/17	39																		
45	Fixing and Grouting the T50 Anchor bar	2 days	Fri 06/8/18	Mon 06/8/21	44																		
46	Coring the holes for bar anchor	6 days	Wed 06/8/30	Wed 06/9/6	41																		
47	Fixing and Grouting the T50 Anchor bar	2 days	Thu 06/9/7	Fri 06/9/8	46																		
48	Fixing the links in two caissons	1 day	Mon 06/9/11	Mon 06/9/11	47																		
49	Infill concrete into two caissons	1 day	Tue 06/9/12	Tue 06/9/12	48																		
50	Cut down the top level of the caisson and break loose c	1 day	Wed 06/9/13	Wed 06/9/13	49																		
51	Breaking Small Part of the Existing Catwalk	1 day	Thu 06/9/14	Thu 06/9/14	50																		
52	Shuttering formworks to cap	2 days	Mon 06/9/18	Tue 06/9/19	51,42																		
53	Fixing rebar to cap	2 days	Wed 06/9/20	Thu 06/9/21	52																		
54	Concreting the cap	1 day	Fri 06/9/22	Fri 06/9/22	53																		
55	Construction of concrete mass at causeway	26 days	Thu 06/9/7	Fri 06/10/13																			
56	Phase 1	12 days	Thu 06/9/7	Fri 06/9/22																			
57	coring the holes for T50 bar	1 day	Thu 06/9/7	Thu 06/9/7	46																		
58	Fixing and Grouting the T50 anchor bar	1 day	Fri 06/9/8	Fri 06/9/8	57																		
59	Excavating the existing slope	1 day	Mon 06/9/11	Mon 06/9/11	58																		
60	Concreting bedding of the mass	2 days	Tue 06/9/12	Wed 06/9/13	59																		
61	Shuttering formworks to the mass	2 days	Thu 06/9/14	Fri 06/9/15	60																		
62	Fixing rebar to the mass	2 days	Mon 06/9/18	Tue 06/9/19	61																		
63	Concreting the east side mass	1 day	Wed 06/9/20	Wed 06/9/20	62,18,49SS																		
64	Laying the steel plates for the UB	2 days	Thu 06/9/21	Fri 06/9/22	63,17																		
65	Phase 2	25 days	Fri 06/9/8	Fri 06/10/13																			
66	Coring the holes for T50 bar	2 days	Fri 06/9/8	Mon 06/9/11	57																		
67	Fixing and Grouting the T50 anchor bar	1 day	Tue 06/9/12	Tue 06/9/12	66																		
68	Excavating the existing slope	1 day	Tue 06/10/3	Tue 06/10/3	94																		
69	Concreting bedding of the mass	1 day	Wed 06/10/4	Wed 06/10/4	68																		
70	Shuttering formworks to the mass	2 days	Thu 06/10/5	Fri 06/10/6	69																		
71	Fixing rebar to the mass	2 days	Mon 06/10/9	Tue 06/10/10	70																		



Works Order Program : ME/032/04, Rev 6  
 Reconstruction of Catwalk at Tung Ping Chau Public Pier  
 Updated on: Tue 06/8/29



Works Order Program : ME/02/04, Rev.8  
 Reconstruction of Catwalk at Tung Ping Chau Public Pier  
 Updated on: Tue 06/09/29





## Figures

NOTES:  
 1. ALL DIMENSIONS ARE IN METRES.  
 2. ALL CO-ORDINATES REFER TO HONG KONG GEODETIC DATUM 1980 AND ARE IN METRES.

LEGEND  
 ▲ CONTROL STATION  
 ○ MONITORING STATION

no.	date	description	checked	approved
REVISION				
developed		name	initial	date
		K Y LAU		20-9-05
drawn		C K LI		20-9-05
traced		C K LI		20-9-05
checked		W C LEUNG		20-9-05

approved  
 contract no.  
 file no.  
 project no.  
 contract

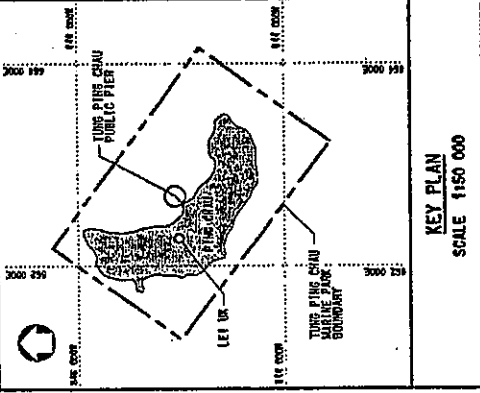
drawing title  
**IMPROVEMENT WORKS TO  
 TUNG PING CHAU PUBLIC PIER -  
 ENVIRONMENTAL MONITORING**

drawing no.  
**PW-TPC-006**  
 scale  
 1 : 2000  
 OR  
 AS SHOWN

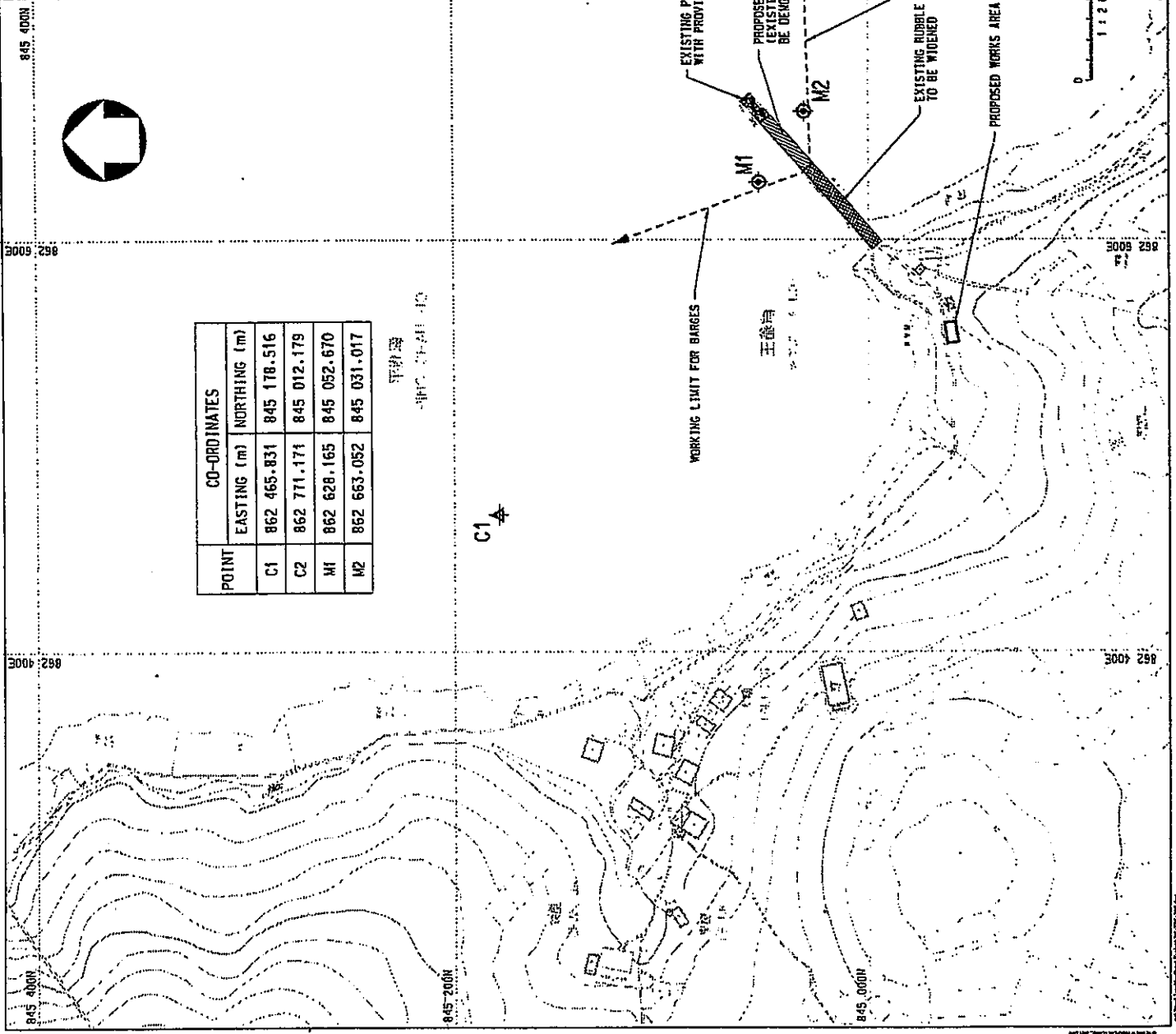
office  
 PORT WORKS DIVISION  
 CIVIL ENGINEERING OFFICE



A3 480 x 207



POINT	CO-ORDINATES	
	EASTING (m)	NORTHING (m)
C1	862 465.831	845 178.516
C2	862 771.171	845 012.179
M1	862 628.165	845 052.670
M2	862 653.052	845 031.017



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